FOUNDRY TRADE JOURNAL

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Offices: John Adam House, John Adam St., London, W.C.2

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Drayton Manor · Tamworth · Staffs

* Registered Trade Marks

Union Carbide* new briquettes

The new Union Carbide briquettes mean advantages all round for ferro alloy users—advantages in cost, convenience and consistency.

new economical shape

The new shape and method of packing have cut our production costs and we have passed the savings on to you. If you are a tonnage customer you save even more!

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The new briquettes are packed in easily manhandled bundles weighing approximately 56 lb. secured with metal straps, making packing, stacking and checking easier than ever. Quantities over 5 cwt. come on non-returnable pallets.

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We carefully control the quality of the alloy and its even distribution through the briquette. The result is that the separate halves of each briquette contain exactly the same amount of additive.

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If you would like trial lots of the new briquette or if you would like to see one of our representatives immediately, please phone your nearest area office.

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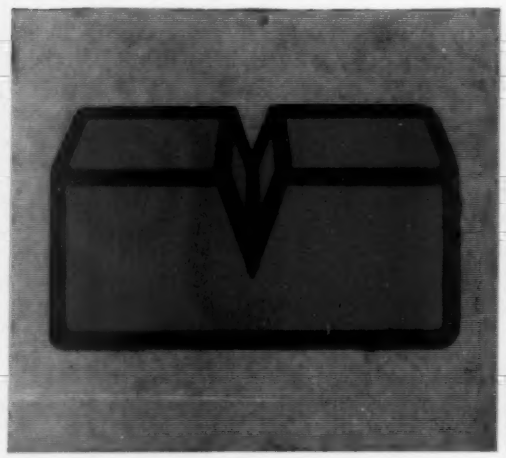

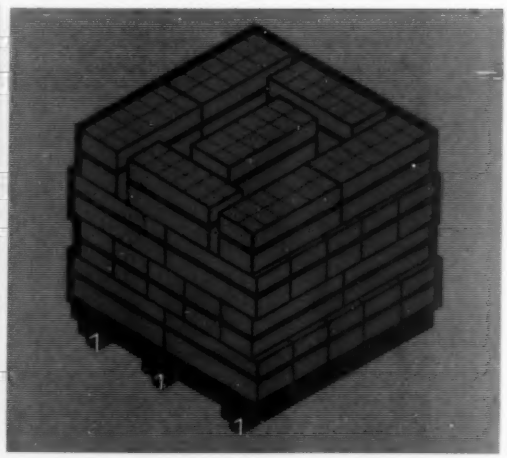

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UNION CARBIDE LIMITED · ALLOYS DIVISION · 8 GRAFTON STREET · LONDON W1 · MAYFAIR 8100

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* SELF SETTING OILS
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* SAND IS FLUID
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Spermolin (REGISTERED TRADE MARK)

Established over half a century

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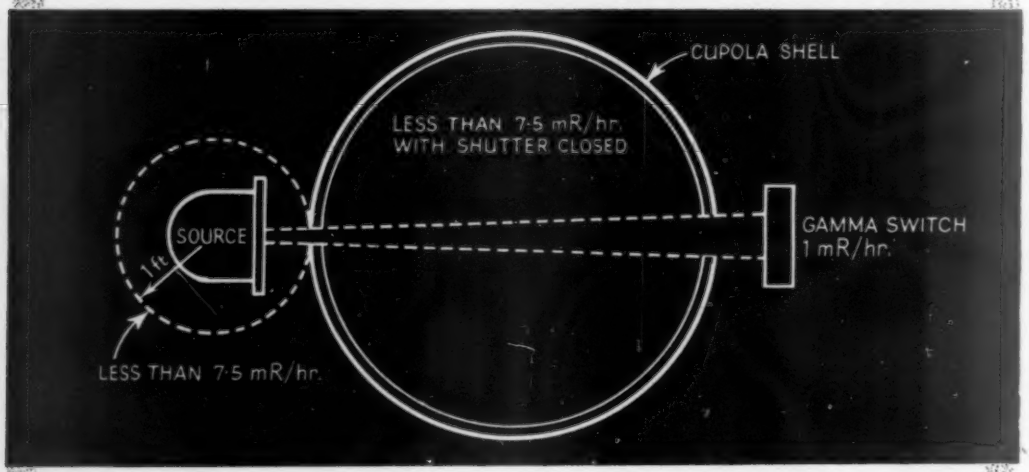
CUPOLA CHARGE LEVEL INDICATOR

The Elliott-I.D.L. charge level indicator enables cupola charging systems to be operated automatically with complete safety. It provides certain and consistent results with minimum maintenance.



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Sinex Vibrating Screens, Conveyors and Knockouts
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The Elliott-I.D.L. indicator consists of a radio-isotope source and a gamma switch detector. The source is mounted in a protective housing on the cupola at the desired level and the gamma switch diametrically opposite. Rays from the isotope cross the cupola and are picked up by the detector unless they have been interrupted by iron in the charge. The detector can be used to operate signal lamps or bells or an automatic charging system. Single or two level indication can be provided.

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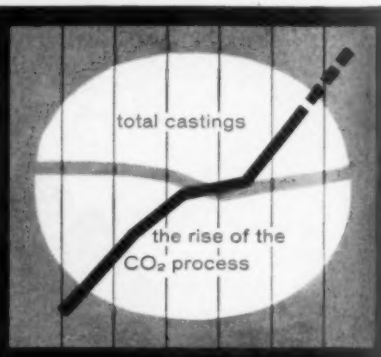
A2

the simplicity of the CO_2 process for making better cores and moulds faster



HARD AND FAST FACTS 1

The simplicity of the CO_2 sodium silicate process is bringing important improvements to foundry productivity. For these reasons: A single type of sand is used for both cores and moulds. This cuts down mixing and testing. Stove drying is completely eliminated, saving cranage space and fuel. With no lengthy stoving and cooling, fewer mould boxes are needed and turn round is rapid. Bonding by CO_2 injection is done on the spot and takes only a few minutes. There is no sagging because of the excellent dry strength of the sand and sodium silicate mix, no distortion, because the bonding process is accurately controllable. This leads to fewer rejects, greater casting yield and much improved dimensional accuracy and finish. The whole process requires the simplest equipment and makes for better working conditions with reduced fumes and dust.

For details write to:
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Carbon Dioxide Department C1, Devonshire House, Mayfair Place, Piccadilly, London, W.1.
Telephone: MAYfair 8867

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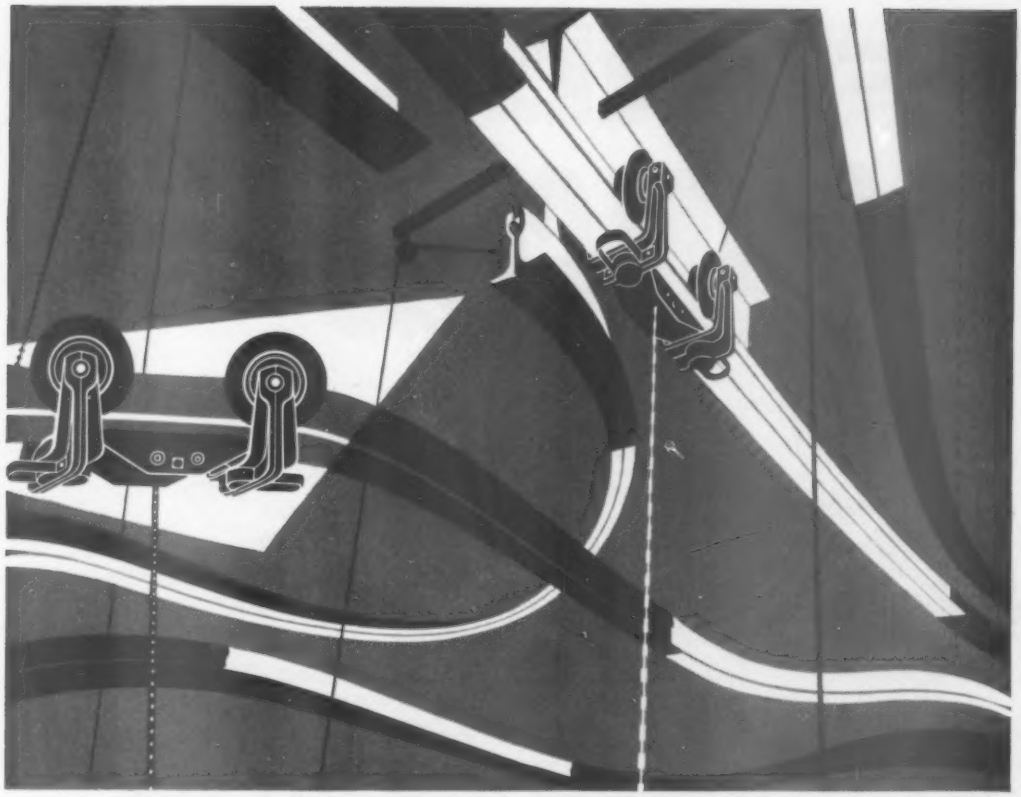
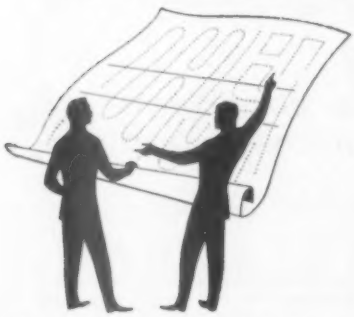


OVERHEAD is the open road



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send for the man with the MONORAIL plan

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FORDS use DOHMfrac

The new Consul Classic has components cast with DOHMfrac resin pre-coated sand

DOHMfrac is a pre-coated sand of consistent grain size giving uniform strength.

DOHMfrac can solve one of your shell moulding problems.

DOHMfrac

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BUT YOU DON'T HAVE TO SUFFER
from
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PEAT FLOUR

will prevent these defects
and give in addition:—

REDUCED FRIABILITY
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EASY BREAKDOWN

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MANUFACTURE THIS SPECIALLY PREPARED PEAT
SUBJECT OF B.C.I.R.A. REPORT No. 531
MARKETED EXCLUSIVELY BY
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This advertisement has been produced in association with Richardson's Moss Litter Co. Ltd., of Carlisle.

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Rolled Steel MOULDING BOXES

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PELLETED FOUNDRY PITCH

BRITISH PATENT NO. 632734

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THE PAST - CONSTRUCTIONAL have supplied Cupolas under the "TITAN" trade mark to all parts of the world.

THE PRESENT - CONSTRUCTIONAL are supplying Cupolas to customers in this country and overseas, both Cold Blast and Hot Blast installations, utilising either independently fired or recuperative blast heaters.

THE FUTURE - CONSTRUCTIONAL offer a full range of Melting Plant complete with mechanised handling facilities; Cold Blast Cupolas, Hot Blast Cupolas with either independently fired or Recuperative Blast Heaters, oil fired or electric receivers.

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THE CONSTRUCTIONAL ENGINEERING Co LTD

TITAN WORKS · CHARLES HENRY ST. · BIRMINGHAM 12.

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Non-Silica PARTING POWDER

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PHŒNIX WORKS & PLUMPTON MILLS PENISTONE near SHEFFIELD
Telephone: PENISTONE 3121 and 3122 *Telegrams*: BLACKING, PENISTONE

controlled consistency

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Suppliers of High Grade Moulding Sand

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ADD R_xMET QUALITY CONTROL TO YOUR CASTING SCENE

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TOOL STEELS • STAINLESS STEELS
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If you're casting stainless, or planning to, you'll want the FREE bulletin, "Heat Treatment and Properties of Cast Hardenable Stainless Steels". WRITE TODAY!

In matters of weight . . .
. . . where quality is as important as size,
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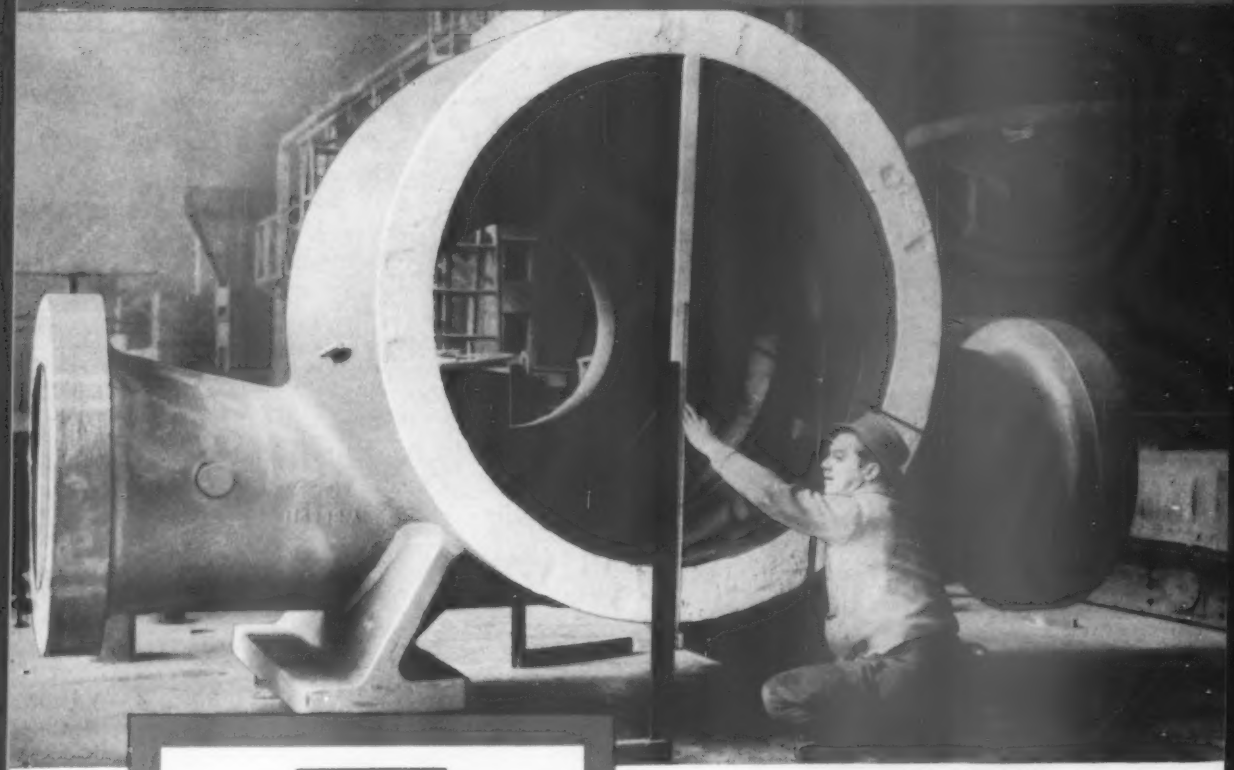

FOSECO
INTERNATIONAL LIMITED
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Telephone: EASt 1911 (10 lines)
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A 20-ton volute casing cast by Canadian Steel Foundries Limited, Montreal to the order of Canadian Ingersoll-Rand Company Limited, for installation in the Trans-Canada Pipeline—using Foseco products supplied by Foundry Services (Canada) Limited.

WORLD WIDE SERVICE
FOR FOUNDRYMEN

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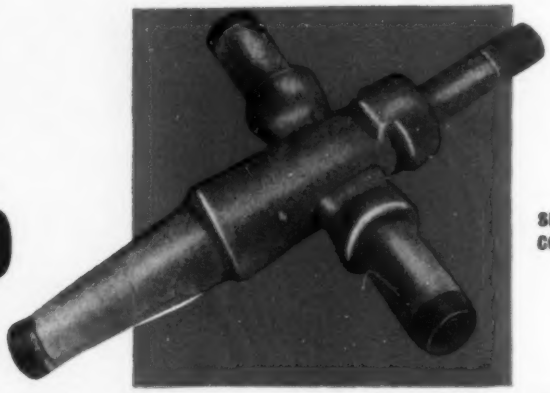
CHELFORD



SHELL CORE

Silica Sands for CORES

Produced at one of Britain's finest and most up-to-date plants, these sands are available in three grades.

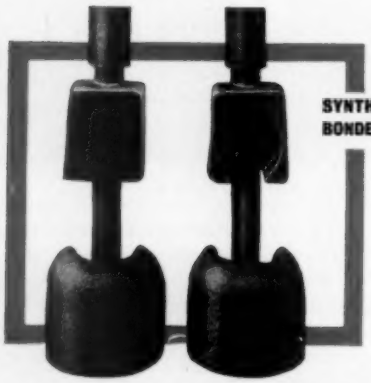
CHELFORD PROCESSED COARSE

CHELFORD PROCESSED FINE

CHELFORD WASHED AND SCREENED

Sands from the Hydrosizers are clay free and correctly graded to meet the most exacting demands of the user.

CO_2 CORE



SYNTHETICALLY BONDED CORE

Photographs by courtesy of Messrs. David Brown Industries Ltd.

B.S.I. GRADINGS

CHELFORD PROCESSED COARSE:	Approx. Range 30-85 low in minus 100's
CHELFORD PROCESSED FINE:	Approx. Range 60-150
CHELFORD WASHED AND SCREENED:	Approx. Range 22-150

Full particulars and recommendations for the use of Chelford and other sands in the G.R. range will gladly be sent on request.

GENERAL REFRACTORIES LTD

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The GENEFAX GROUP for everything in Refractories

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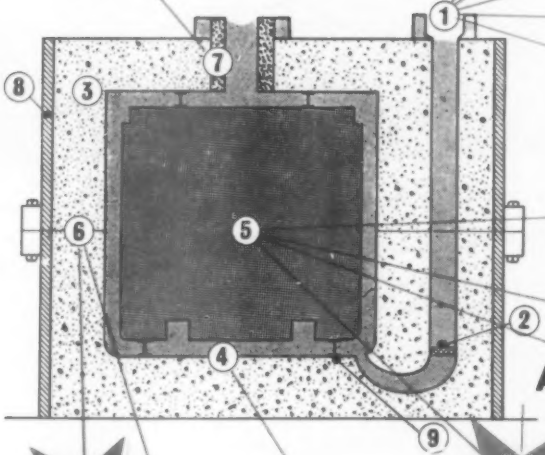

Key to Sectional Drawing of Mould

		Send for booklet No
1	Metallurgical Control use of Fluxes	3
2	Clean Metal by using Ceramic Strainer Cores and Discs.	4
3	Coal Dust additional to Facing and Backing Sand	1
4	Silverskin Blackings, Plumbago and Mould Dressings.	1
5	Cores using Crulin and Crudol Core Binders (Oil Bonded, Air Setting Cereal or CO.2 Binders).	2
6	Moulds Parted with Beecro Silica Free Parting Powder or Beecrol Parting Liquid.	1
7	Casting Feeding with Alsica Exothermic Feeder Heads.	4
8	Moulding Boxes supplied by B.F.U.	5
9	Chaplets, Studs, etc.	

is provided by—

BRITISH FOUNDRY UNITS LTD.,

Sole Agents for The Vortec Foundry Machines.

FOR THE ONLY COMPLETE SERVICE TO THE FOUNDRY

RETORT WORKS **CHESTERFIELD**

Telephone : 4157/8 Telegrams : "RETORT"

CO_2 SILICATE PROCESS
CO_2 SILICATE PROCESS

QUICK CHANGE TO I.C.I. LIQUID CO_2

The East Sussex Engineering Co. Ltd. is an old-established foundry with modern ideas. They use up-to-date techniques like the CO_2/Silicate process for the speedy production of high quality moulds and cores. Recently, they decided to change to bulk supply of I.C.I. liquid CO_2, and install I.C.I.'s 5-ton storage tank.

To avoid interrupting normal foundry production, the installation took place over a weekend. The tank was delivered on Friday, installed on Saturday, and in operation on Monday. I.C.I. Technical Service staff were there to supervise start-up, and show the foundry operators how to use the tank. Foundry work went on as usual.

For a sizeable foundry like East Sussex Engineering, buying liquid CO_2 in bulk is clearly a sound proposition, but even if you use as little as 30 tons a year, the I.C.I. liquid CO_2 tank is still a good investment. It means you buy CO_2 the cheapest way—as liquid in bulk.

If you would like to know more about the advantages of bulk supply of I.C.I. liquid CO_2, get in touch with:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1.

I.C.I. PRODUCTS AND THE CO_2 SILICATE PROCESS

The East Sussex Engineering Co. Ltd. uses the CO_2/Silicate process for making moulds and cores. The CO_2/Silicate process eliminates stoving, cuts fuel costs, cuts handling charges, saves time, and increases output. I.C.I. supplies for the CO_2/Silicate process:

CARBON DIOXIDE

'Drikold' solid CO_2 used in the 'Drikold' liquefier—a convenient source of CO_2 for smaller foundries.

Liquid CO_2 in bulk and I.C.I.'s 5-ton storage tank—recommended for the larger foundry.

SODIUM SILICATE

grades C.112 and C.125—supplied in 10- or 45-gallon drums, and in road or rail tank vehicles.

ISOPROPANOL

for the preparation of ignitable mould or core dressings. Refined isopropanol or 'Imsol' A (isopropanol/water azeotrope)—supplied in 45-gallon drums or in road or rail tank vehicles.

TECHNICAL SERVICE

The skill and experience of I.C.I.'s Technical Service staff are available for the assistance of customers both in the selection of products and the operation of the CO_2/Silicate process. For a visit by a technical service representative, or for further information, get in touch with:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1. DX.350

CO2 SILICATE PROCESS

Well Mix No. 70
THE FINEST GRAPHITISED GROUND MATERIAL FOR LINING HOT BLAST CUPOLAS
* Easy to ram.
* Easy to patch.
* High resistance to basic slags.
* Promotes high carbon pickup & good sulphur reduction.
* Long life.
* More economic than basic refractories.
WELL MIX No. 70 is produced by
PICKFORD, HOLLAND & CO. LTD
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BIG SHOTS IN HISTORY
500 years ago "Mons Meg" made history as one of the most advanced cannons of its day . . .

1461

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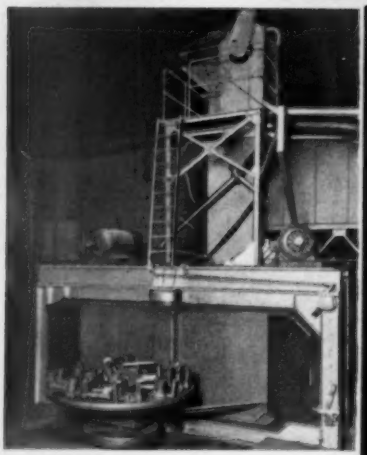


Dual Swing Table Wheelabrator Plant using Wheelabrator Steel Shot

. . . Today Tilghmans are making history with Dual Swing Table Wheelabrator Plants using Wheelabrator Steel Shot.
Illustrated above is a 6ft. plant installed at Jarrow Metal Industries Ltd., engaged in cleaning a miscellaneous load of steel castings and the cleaning cycle is eight minutes. This type of plant enables one table to be unloaded and reloaded whilst the other table is under the blast stream, and each table is capable of carrying two tons.

TILGHMAN'S
STAVELEY GROUP

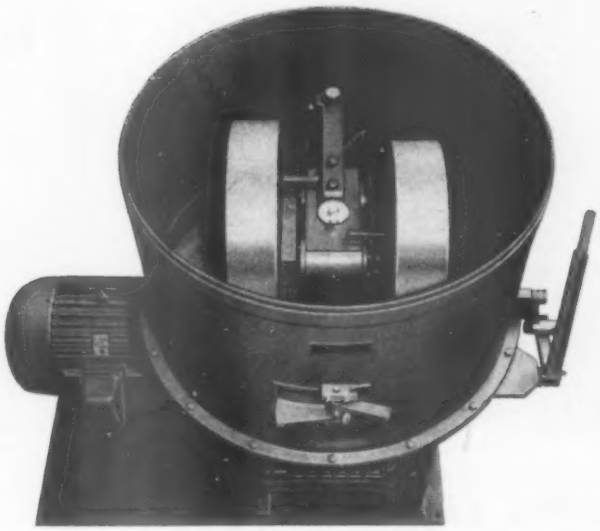
BROADHEATH, ALTRINCHAM, CHESHIRE
London Office: 1, Chester St., S.W.1.

TAYSON T508

FOUMEC

42" dia Batch Type PLANTS

Sand Mill.



This Foumec 42in. Sand Mill is exceedingly versatile and ideal for varied and small requirements.

As a facing Sand Mill, for sands of an average bond strength, its capacity is approximately 3 cwts. per batch. Due to its high efficiency, and at a rate of 12/15 batches per hour, its output for facing sand can be approximately 2 tons per hour.

As a mixer for core sand with a low green bond strength the batch can be raised to 4 cwts. At 12/15 batches per hour this will give approximately 3 tons per hour.

Further details are yours for the asking, why not contact us today.

Interesting features.

★ Mullers mounted on ball bearings. They are connected to the centre pivot by a lever arm which allows them to rise or fall to suit the depth of sand in the pan.

★ Sand Mill, vertical gear and motor assembly, all on one base plate.

★ Device provided for taking sand sample without danger whilst in operation.

★ Stops are provided to prevent the mullers bearing on the pan when the latter is empty.

★ Single or double evacuation door, hand or pneumatically operated.

★ All internal parts efficiently protected against sand infiltration.

★ Centre pivot mounted on upper and lower taper roller bearings.

★ Provision of a replaceable pan bottom wearing plate and also ring.

★ Top orientable cover with hinged portion for loading materials.

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Tel.: BLETCHLEY 3354 *Regd. Office:* 29, CROMWELL ROAD, LONDON, S.W.7. *Grams:* "FOUMEC" BLETCHLEY.

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MARSHALL

have acquired

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(Patent applied for)

Specially designed and manufactured by

LLOYDS (BURTON) LTD.

for use in the

Drying and Pre-heating of Ladles

*** THE LLOYDS LADLE HEATER OFFERS THESE ADVANTAGES**

1. The heating is rapid and uniform, and kind to the refractories.
2. The heater gives a predictable heating cycle and greater availability of ladles.
3. It requires substantially less fuel.
4. It is easily used and maintained.

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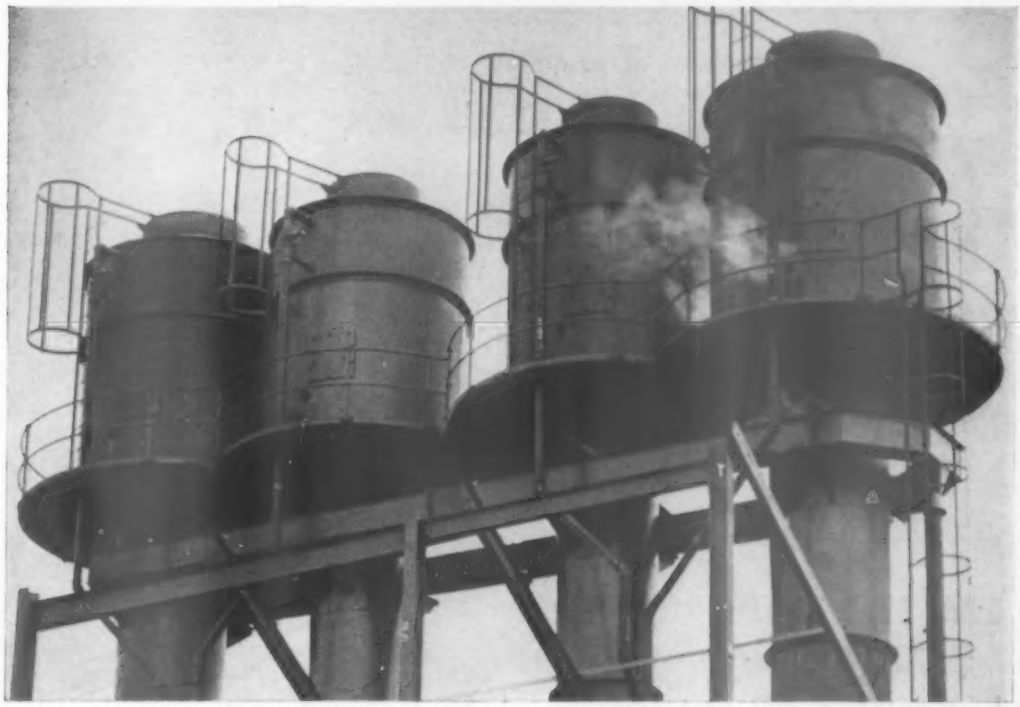
THOS. MARSHALL & CO. (LOXLEY) LIMITED.

STORRS BRIDGE WORKS, LOXLEY, NR. SHEFFIELD. Tel. 343844/8.

DUST ARRESTERS



Photograph by courtesy of R. J. Hunt & Sons Ltd.

Here is a recent installation on 4 existing cupolas, adding to the impressive number of INCANDESCENT-WHITING wet type dust arresters now working in this country. The experience gained over many years with this type of arrester is available to solve *your* particular problems. Why not ask for an engineer to call or better still write today for leaflet FP.2.

INCANDESCENT FOUNDRY PLANT

THE INCANDESCENT HEAT CO. LTD.
SMETHWICK, ENGLAND

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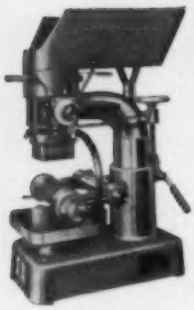
HANSBERG Coreshooters

For Denser Cores and Faster Production



TYPE H 2lbs.

Extended core box life.
Minimum venting problems.
Minimum air consumption.

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Telephone: CHELTENHAM 55105.
Patented and Mfd. by Off. Mecc. FRITZ HANSBURG Modena, Italy.

H5A, H12A, H25A, H80.
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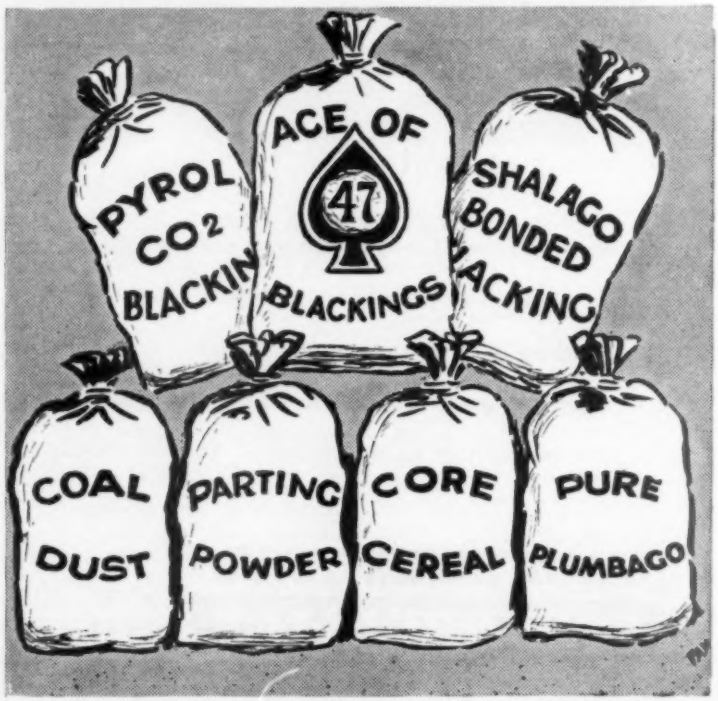

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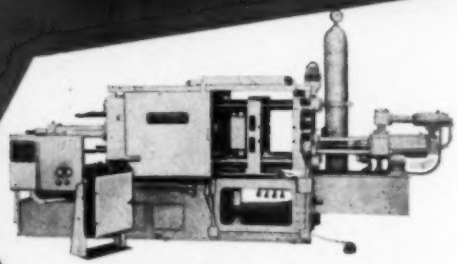

40 DC 5
Locking force: 300 tons
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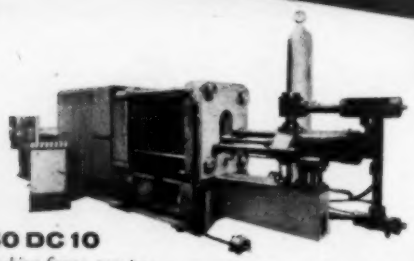
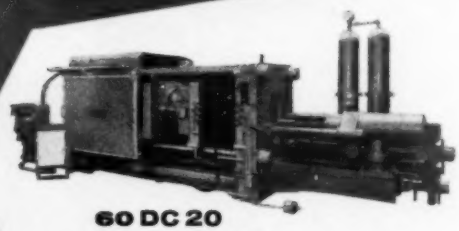


50 DC 10
Locking force: 500 tons
Shot weight: 11 lb. aluminium 30 lb. brass



60 DC 20
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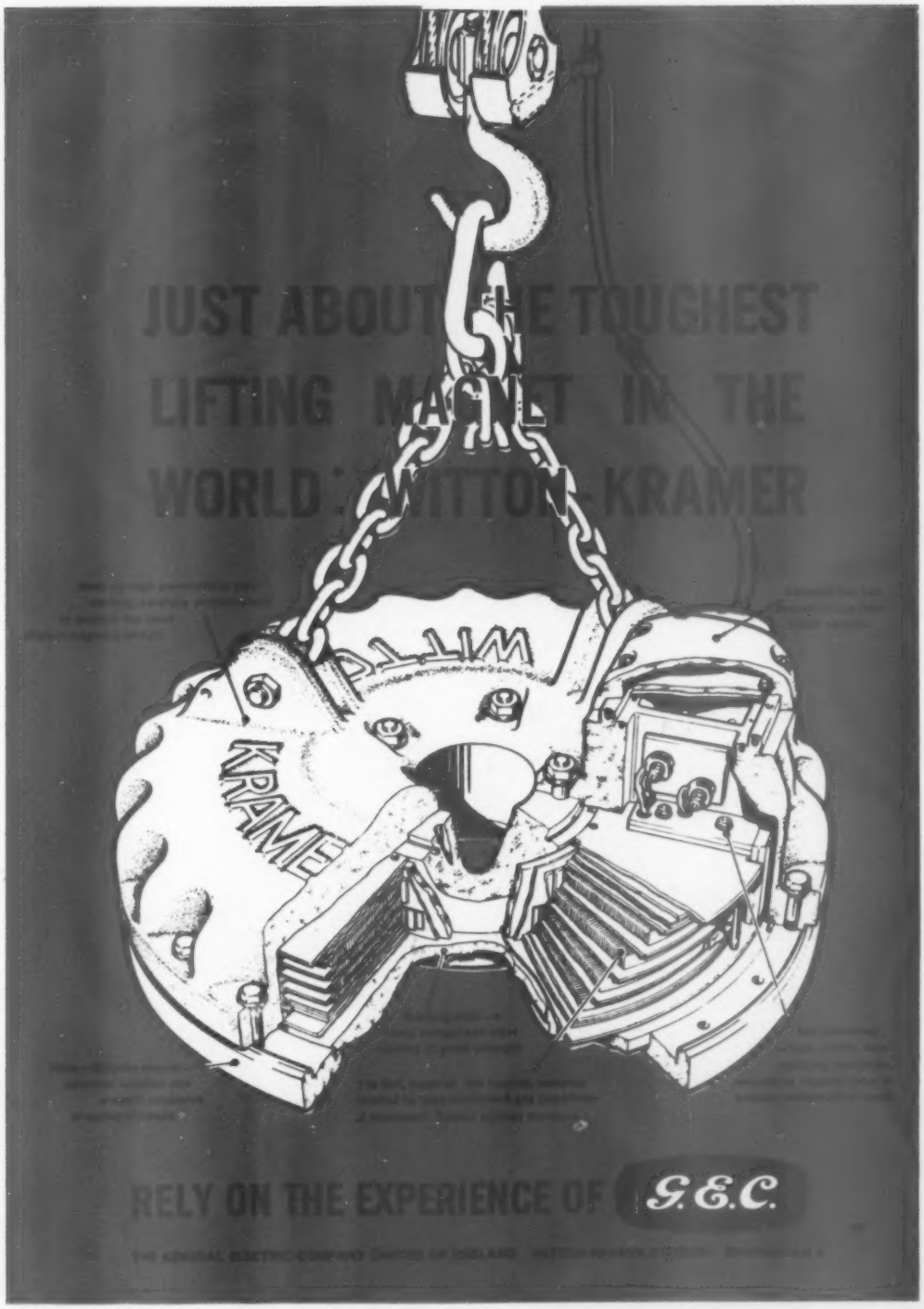
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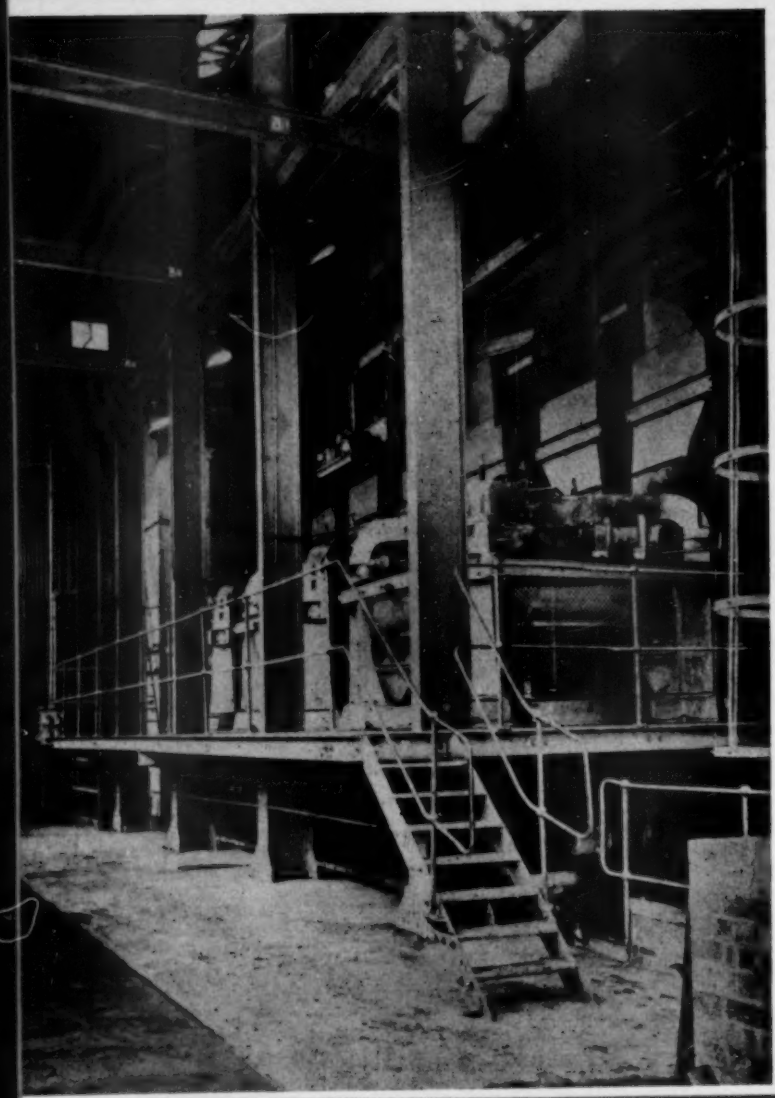

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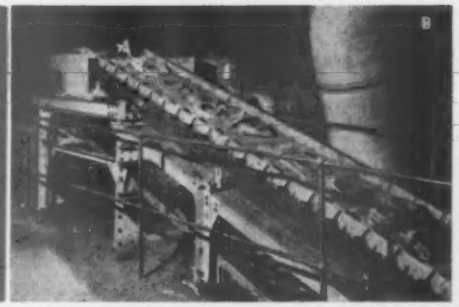
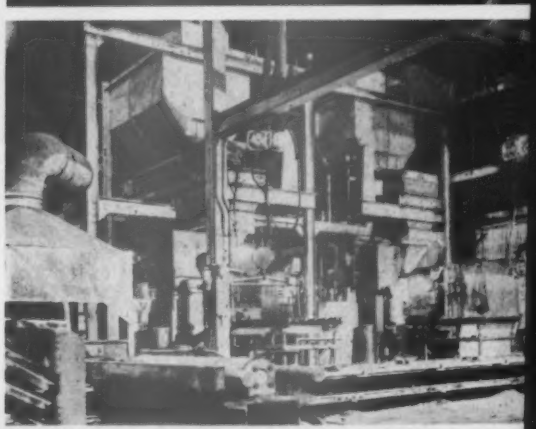


Casting Conveyor. Inset A shows discharge end of automatic shakeout, empty box return unit and castings disposal. Sand falls through shakeout and returns to system. Inset B shows heavy duty hot castings conveyor from automatic shakeout.

General View of Semi-Automatic Special Moulding Unit showing sand feed system, mould conveyor and handling plant.



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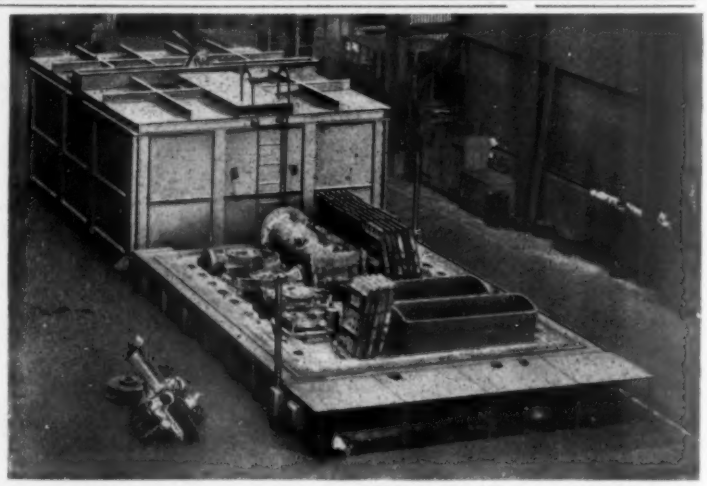

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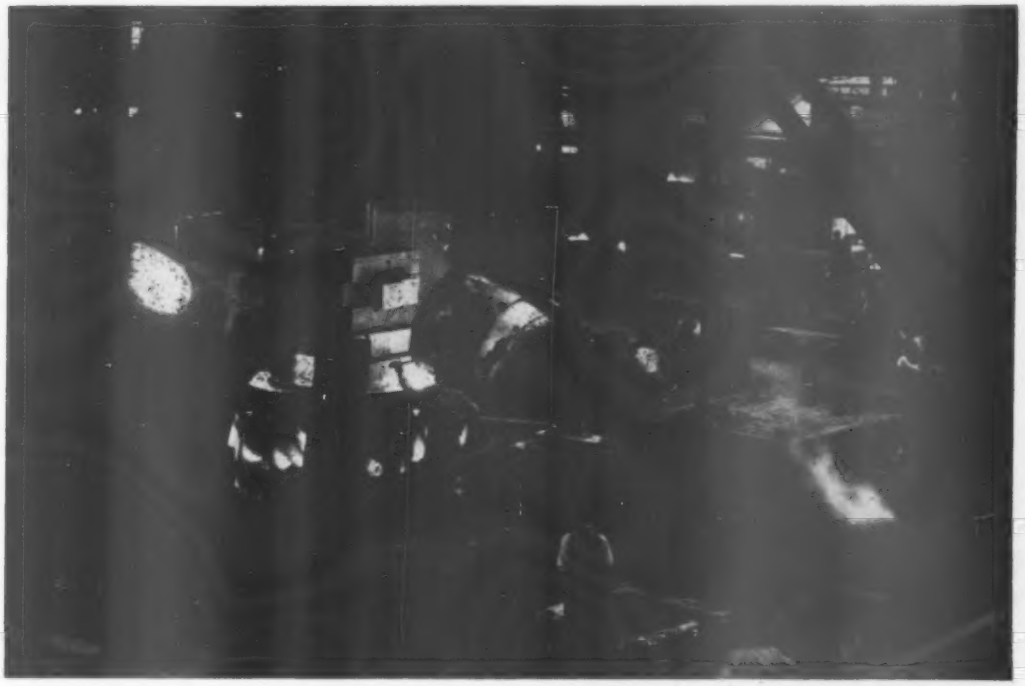

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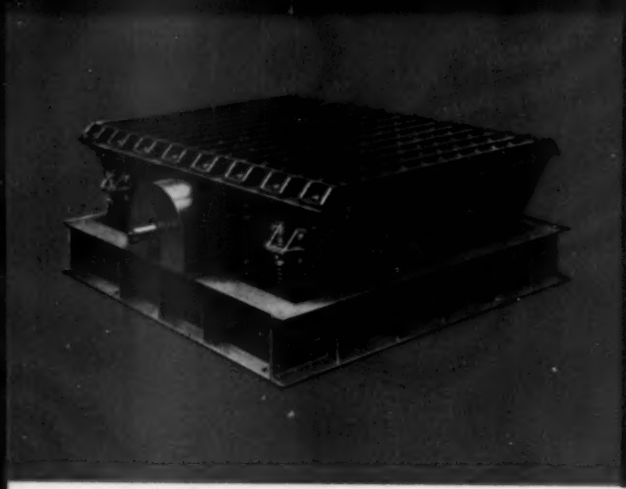

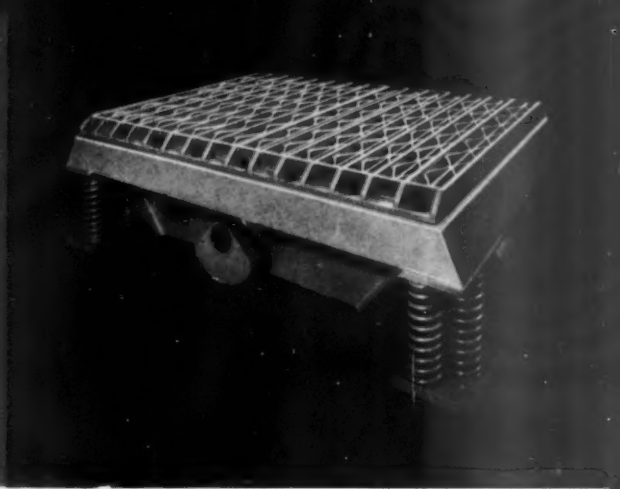

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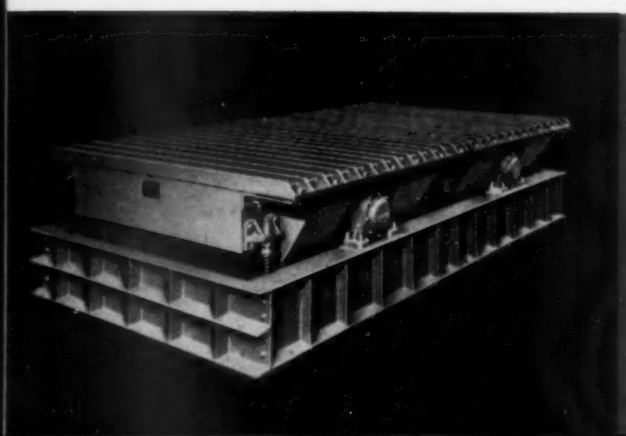

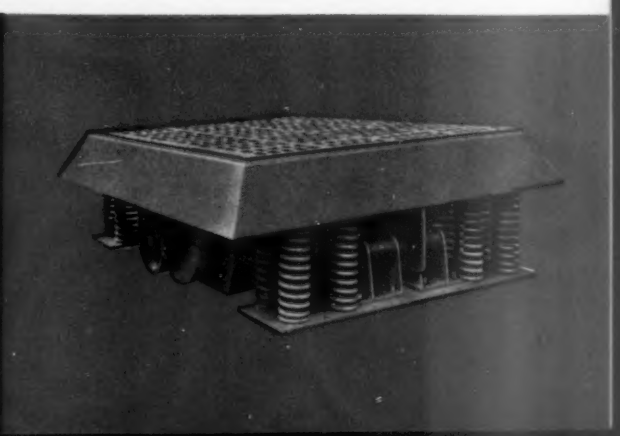

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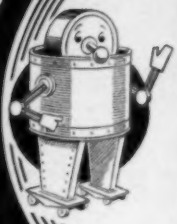
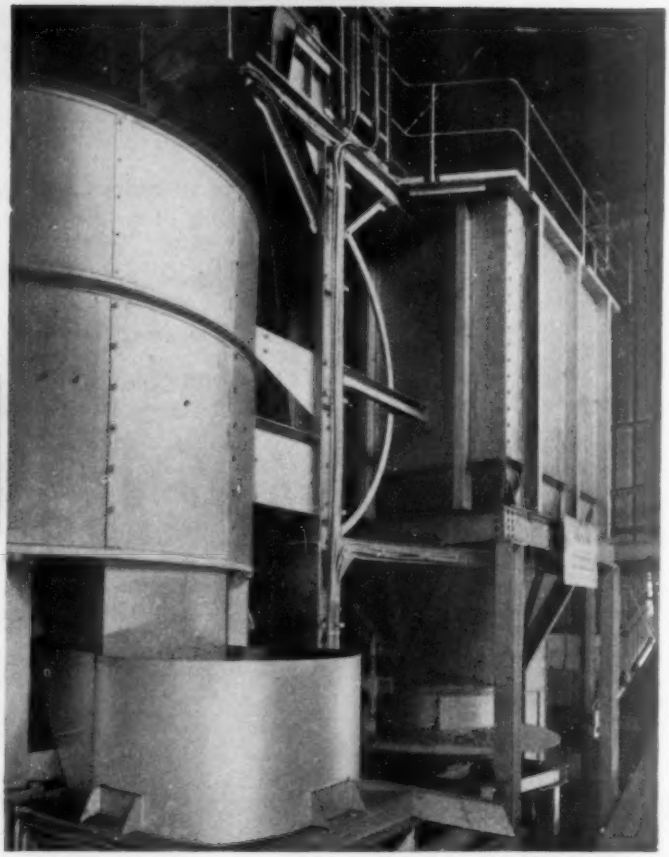
MODERN FOUNDRY EQUIPMENT by AUGUST'S





Photograph shows:

Large storage hopper with rotary table feeding new sand to a bucket loader, which in turn, charges a 3F size Mix-Muller—batch capacity 4,000 lbs.

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Iron Castings to Specification

It is apparent from reading the article on this subject printed on page 111 of this issue that America has much leeway to make up in the application of standard specifications to the supply of iron castings. Ignorance of specification has been encountered closer at home, too, however, for though the colours of engineers' patterns had been standardized for about five years, a speaker at a provincial technical meeting obviously thought he was putting forward a novel idea in suggesting that pattern colours would be a good subject for the British Standards Institution to tackle. Since that time—probably about 10 years' ago—much progress has been made in the United Kingdom with adoption of standards. Moreover, they have been made more important by the introduction of the B.S.I. " Kite "-mark scheme. In the American survey, covered by the JOURNAL article referred to earlier, one foundry owner replied to a question about test-bars by saying that " we would talk our way out of this one." A better answer would have been " we will talk to our staff into seeing that the buyer's requests are met."

The position in this country is, in general, that iron castings are mostly being supplied to BS specifications. For example, displayed advertisements of foundry firms on railway premises and elsewhere announce that " castings are supplied to a range of specifications "—which are listed. For the higher grades of iron, such as those with spheroidal- or nodular-graphite structure, we doubt if any is sold except against specification. Of course, there is also a number of trade-marks in use under which castings are sold, such as " Meehanite," for example, but here the corresponding mechanical and other properties are available and are quite well known amongst buyers. The use of private specifications seem to be more widespread in America than here, though they still exist. Quite often, buyers' requirements are merely set out in a letter or order and are of such a character that they are quite unsuitable for use as a specification.

One entry in table 2 (page 111) " Major ASTM Specifications," calls for comment, namely, " A 190—Lightweight and Thin-section Grey-iron Castings." Similar conditions to those recorded exist also in this country, but where a percentage of the castings has to be vitreous-enamelled, internal specifications imposed by purchasers are often quite severe and can only be met by meticulous control of manufacturing processes. Obviously, there are quite a few foundries of the jobbing type which make replacement castings for breakdown work and these place rapid service above everything and so may ignore specifications. However, in all probability they still meet the lowest grades of a specification as real care is exercised in the selection of raw materials. The founder is often aware of the duty expected from the castings he supplies, but the average buyer prefers to cover himself by quoting a specification. Herein lies the supreme onus on British founders to make castings which conform to the conditions specified by the BSI. They are not too onerous and commonsense control in the shops will ensure that they are met.

BISRA Awards

Dr. J. Pearson, assistant director of BISRA, presented on July 14 awards in a scheme organized by BISRA in conjunction with the Commonwealth Technical Training Week. Boys from Sheffield secondary schools had been invited by Dr. Pearson with the co-operation of several Sheffield research organizations to carry out simple research projects. The boys from Hurlfield, Jordanthorpe, and Shiregreen schools, produced reports on a number of subjects ranging from stainless steel to the manufacture of files. Sixteen boys received awards for "their outstanding ability and initiative." Dr. Pearson said, "The overall standard of the reports was so high that it was unreasonable to discriminate between them. Instead of selecting one or more prize-winning entries we decided that each should receive some reward. Although only a small part of the Commonwealth Technical Training Week, the project realized fully the aims of the week in a novel manner. The boys were introduced to industrial and research establishments in a way which underlined the value of training." He added, "Appropriately, the attitude required to tackle these problems was very much the attitude essential to the young trainee who would succeed in any field."

Patternmaker's Success Story

Fourteen years' ago, Mr. W. J. Crockett left his patternmakers' bench at Wright & Platt, Limited, Birmingham, to set up in business on his own. Last week, it was announced that he is back—as the new proprietor. Mr. Crockett is already chairman and managing director of the Birmingham engineering patternmaking firms of Crockett, Lowe, Limited, Robinson & Knee, Limited, and C. L. Developments, Limited.

He bought Wright & Platt, Limited, which was in liquidation, and has re-formed it as Wright & Platt (1961), Limited. The business will be carried on with its staff of about 60 in Birmingham and 26 in Manchester. The Crockett-Lowe group of firms now employs about 275 workpeople. Mr. Crockett is active both in the National Society of Master Patternmakers and the National Union of Manufacturers.

Moulder joins Golden Eye Club

On July 20, on behalf of the Royal Society for the Prevention of Accidents, Mr. J. C. Leith, director of Smith & Wellstood, Limited, ironfounders of Bonnybridge, Stirlingshire, presented Mr. Hugh Stark, a moulder, with a membership card for the Golden Eye Club and a club badge, which is in the form of a gilt and enamel golden-eyed duck's head. Only persons who have prevented injury to the eyes by the wearing of protective devices provided for them are eligible for consideration for election to membership of the club. Mr. Stark's eyes were saved from serious injury when molten metal shattered the glass in his protective goggles while in the foundry.

Latest Foundry Statistics

Copper-base Castings. The July *Bulletin* of the British Bureau of Non-ferrous Metal Statistics states that production of copper-base castings during May was 7,122 tons. The output for the five months of this year was 35,600 tons, which is about 1,000 tons less than for the same period of last year.

"Astronautical Publicity"

The early association of the Russian astronaut with the foundry industry, which was made much of during his visit to the UK a week or so ago, resulted generally in excellent publicity for the foundry industry as a whole. It will be recalled that Major Gagarin was admitted an honorary member of the Amalgamated Union of Foundry Workers and toured the foundries of A.E.I. (Manchester), Limited. The photograph shows him being introduced by Mr. F. Hollingsworth, AUFW chairman, to a group of employees at the Trafford Park works.

Resulting from the very extensive treatment given to foundry aspects of Major Gagarin's career in the daily Press, one can imagine members of the public asking one another "What is a foundryman; what do they do?" "How does foundrywork fit a man for a journey towards the stars?" Yet another side to the publicity, however, is shown in this captioned cartoon taken from the Sunday Pictorial of July 16, 1961, inasmuch as it seems to give the impression that foundrymen dislike their jobs! However, it is certainly an amusing viewpoint.

D. Langdon.

"Get me out of ruddy foundrywork, I sez to 'er, and I'd have a nice boyish grin like Yuri Gagarin, too. . . ."

Work Simplification in Steel Foundries

Proceedings at a BSCRA One-day Conference

Current interest in the steelfoundry industry in a rational approach to the use of time and labour appears to stem from two opposing sources—over- and under-employment of capacity. The former with its pressure on available space and equipment leads to the search for better utilization of existing resources, whilst the latter arises from the need to reduce costs by their more economical deployment. Whatever the motive, this interest can lead to greater efficiency in foundries. The following article gives an account of the proceedings at a one-day Conference held at York on April 20 under the auspices of the British Steel Castings Research Association and summarizes the four papers dealing with aspects of the subject of work simplification.

The Conference, held at York on April 20, 1961, was the latest stage in the British Steel Castings Research Association's programme of work intended to encourage the adoption, by its members, of work-simplification techniques in the solution of production problems. This work is, in turn, part of the Association's Special Assistance to Industry Scheme, which aims to speed up the application of research to industry and which is financed partly by UK Conditional Aid Funds, administered by the Department of Scientific and Industrial Research, and partly by special contributions from members. The themes of the four papers presented ranged from an introduction to the subject to details of applications in foundries. Work simplification (sometimes known as method study), and work measurement (sometimes known as time study), form the two main parts of the board field of work-study. Although the scope of this Conference covered work simplification, it is not always possible to deal with these two parts of work-study separately and, in fact, two of the papers were concerned with work-study as a whole. The Conference was well supported, about 80 delegates attending, from 43 firms.

The chairman of the Conference was Mr. M. C. Lloyd (F. H. Lloyd & Company, Limited—chairman, BSCRA research committee) and after his opening address, which commenced at 10 a.m., the two papers of the morning session were presented. These were "Introduction to Work Simplification" by A. W. Syme (DSIR industrial operations unit) and "Introducing and using work-study in Steelfoundry Operations" by H. W. Keeble and R. F. Rankin (K. & L. Steelfounders & Engineers, Limited). Both papers were discussed jointly. Similarly, in the afternoon session, two papers were presented in succession and discussed together. These were "Use of Work-study in Planning a Coreshop Layout" by F. Perks (Osborn Foundry & Engineering Company, Limited) and "Steelfoundry Operating Conditions examined by Work-simplification Techniques" by P. Lambert (BSCRA). After the chairman's summary, the Conference ended at 4.30 p.m.

Chairman's Address

Mr. Lloyd first explained that it was the practice of the Association to organize at least one conference each year in addition to their annual conference at Harrogate. Usually of one day's duration, these additional meetings were more specialized than the annual conferences, recent ones having dealt with metallurgical analysis, atmospheric pollution from steelfoundry processes and moulding methods. "Work Simplification in Steel Foundries" was, however, completely new ground and the title had been chosen with some care. "Operational Research in Steel Foundries" had been considered, but was discarded because the title could mean too many things to too many people. At one end of the scale, it concerned simple motion study and, at the other end, cybernetics, the advanced techniques of which were not obviously applicable to jobbing steelfoundry production. The Conference was concerned only with work-simplification techniques, which meant those which would assist in planning plant and equipment layouts and in securing efficient flow of materials and products, in order to achieve maximum efficiency of production. The chairman considered that the jobbing steelfoundry industry was particularly suitable for the application of these techniques, as the papers would show, and if the reductions in costs which appeared possible could be obtained, castings would be able to compete on a better footing with products such as forgings and fabrications. The field was wide open. Whilst not wishing to anticipate the papers to be presented, Mr. Lloyd asserted that every steelfoundry in the country could achieve greater efficiency, reduce costs and improve the standing of the industry by making use of work-simplification studies. Further, the improvements could be effected, in many cases, without major expenditure.

Explaining the Association's interest in the subject, Mr. Lloyd recalled that three years ago the industrial operations unit of DSIR carried out a very successful pilot-study in the coreshop of a member's foundry which demonstrated the value of the techniques in steel foundries. Previously

one of the BSCRA staff had received some training on a DSIR course, held at Roffey Park, in order to be able to assist the unit as a member of the team tackling this study. After further practical training (also organized by DSIR), the investigator made a number of studies in members' foundries, some of the general results of which were to be reported in one of the papers. A snag with these studies was that they took several weeks to complete and a great many members had asked for them to be done. It was true to say that the time involved made it almost physically impossible to give all the assistance which was required. The main purpose of the Conference, therefore, was to encourage members to undertake these studies on a "do-it-yourself" basis, with the Association's help in planning the exercises and interpreting the results. To this end, the Association intended to hold, in June, a short training course in work-simplification techniques for the staff of member-companies. Paying tribute to the help and advice which the Association had received from the industrial operations unit of DSIR, Mr. Lloyd was pleased that the first paper of the day was to be presented by Mr. Syme, a member of the unit. The second paper of the morning session, by Mr. Keeble and Mr. Rankin, represented the experiences of a firm who had proved the merit of using work simplification in steel foundries. The chairman then called on Mr. Syme to present his paper.

What is Work Simplification?

*By A. W. Syme, A.M.I.Mech.E**

The Author complimented the Association on organizing the Conference and on introducing work simplification into the research activities, and the Osborn Foundry & Engineering Company on acting as the "guinea-pigs" for the first study made, under the Association's auspices, by DSIR. The basis of the address was the paper of the same name by Mr. Winston Rodgers, Head of industrial operations unit of DSIR, and the object was to explain briefly the aims, objectives, advantages and some of the shortcomings of work simplification. The activities of DSIR in this field were concerned more with reducing effort than with the distribution of reward for effort but the Author suggested that, in dividing the spoils of work simplification, three groups should be considered, namely, the shareholders, the workers (including technical staff and supervision) and the customers.

General Approach to Management Problems

In the examination of management problems generally, the first step was to establish that the problem as presented to the investigator, was, in fact, the real problem at issue. In many cases, the initial examination showed that the problem posed was merely apparent and restatement was required before proceeding further. It was important to choose an investigator who would be acceptable at all levels of authority in the firm, equally able to discuss the job with the man on the shop floor and to "sell" his ideas to management. When the real problem was identified, the preliminary examination could be made by observation and discussion, and here it was essential to find out what really happened, as opposed to what management thought was happening. The difference between the two was both revealing and important. Confidential information might be made available to the investigator at this stage and both he and the management must respect these confidences. The interpretation of the data collected required logical thought and intellectual honesty to avoid bias on the part of the investigator. After interpreting the results of the preliminary examination, it was sometimes necessary to re-specify the problem again and management should have sufficient understanding to accept the need for a fresh start. The field of investigation, which could be work simplification for example, was now established and formalized techniques, which could be grouped under the general title of models, could be applied to the analysis.

* D S I R Industrial Operations Unit.

Analysis and Synthesis

Assuming that the problem turned out to be one in work simplification, analysis could be of two forms—quantitative and qualitative. The results of these analyses had to be interpreted and an improved method synthesized. During all these stages, participation by the workers was vital, not only as a means to secure their co-operation, which was essential for the successful application of new methods, but also because they often had useful views on improvements which were otherwise unheard. The Author hoped that, as DSIR were responsible for encouraging and assisting research associations to take up work in this field, the Conference and the proposed Appreciation Course would, in the same way, encourage members to use work simplification by showing that systematic analysis, simple techniques and a good deal of common sense would help to improve foundry processes. The real question for members was not "Can we afford work simplification?" but "Can we afford not to adopt work simplification?"

Introducing and Using Work-study in Steelfoundry Operations

*By H. W. Keeble, F.I.M., Assoc.I.Mech.E., and R. F. Rankin**

The Authors referred to the present period of general under-employment of capacity in the steelfounding industry, as a result of which attention was turned to costs generally, and said that work-study could secure the most effective use of equipment and manpower to improve productivity and reduce costs.

† The Authors are, respectively, director and general manager, and head of production study department, K. & L. Steelfounders and Engineers, Limited.

Origins and Nature

In a brief review of the history of work-study, early work in Great Britain and France and the contributions of Taylor, the Gilbreths and Bedaux were mentioned. Mainly as a result of misuse of the latter's techniques in the 'twenties, work-study met with opposition at first, but in the 'fifties particularly it evolved into a balanced force, increasingly recognized and understood by employers and trade unions. The two complementary procedures of this balanced force are method-study, to establish the best way of doing a job, and work measurement to determine the time required to do it. Trouble could be caused if work-study was introduced without previously establishing close collaboration of staff and work-people. Work-study, and its implications, must be accepted by all concerned, from the worker on the floor to top management, if it was to be successful.

Introductory Stages

The foundry industry, the Authors said, was a good subject for work-study because its operations consisted mainly of materials handling. Between 100 and 200 tons of materials were handled in order to get one ton of castings through the despatch door and significant reductions in handling were possible. The results of studies could be extended into incentive schemes, production capacity data and aids to the choice of layout and equipment. The position of the work-study engineer in the organization depended on the character of the administration and the strength of the intent to use the techniques. Humanity at large disliked change, but the use of work-study would be fruitless and frustrating unless all concerned could face up to the changes which it recommended. Confidence in the aims, techniques and recommendations of the work-study engineer, transcending the normal worker-management relationship, was vital and for this reason his personality and integrity were as important as his technical ability.

When introducing work-study, the appointment of a fully-qualified "outsider" (assuming that one was obtainable) meant that some time must elapse before he could gain the confidence of workpeople and management. On the other hand, if one of the existing staff, known and trusted within the firm, were given a relatively short course of training in the techniques, he could immediately carry out relatively simple studies, moving on to more ambitious projects as his experience built up. The Authors knew of no better "tool" for reducing foundry costs requiring as little capital expenditure (office accommodation) on such short delivery (say eight weeks' training) with moderate running and depreciation costs (salary and superannuation) than appointing work-study engineers in this way.

Using Work-study

Until recently, steelfounders have been striving to obtain outputs higher than those normal for their plants and disproportionate increases in indirect activities had been accepted as inevitable. Once accepted, these high levels of indirect activities (mainly services) were difficult to assess and regulate unless work-study is used. The large savings available and the absence of complications and effects on individual earnings, made this field most suitable for the initial studies. Details were given of two such studies in the Authors' firm where substantial improvements had been made in pattern storage and core assembly and storage.

(It is intended to publish this contribution in full in a forthcoming issue of the Journal.)

Use of Work-study in Planning a Coreshop Layout

*By F. Perks**

The Author commenced his paper by saying that the management of Osborn Foundry & Engineering Company, Limited, had long been dissatisfied with conditions in their coreshop and were already studying them when the assistance of the DSIR Industrial Operations Unit was offered. Because the investigators would be free from the burden of production problems and outside the management-worker relationship, the offer was readily accepted. Although management and workers must accept that efficient working was essential for the survival of the foundry industry, it should be pointed out that the time-study part of work-study was not accepted by representatives of operators in some areas and this inevitably led to inefficiencies. As their time was limited, the team were forced to ignore some outside influences on conditions in the coreshop and the management therefore had to examine the recommendations critically in the light of those outside factors. Some recommendations had to be rejected, but even these were valuable, as a close examination of the facts was inspired in each case. To those managements who would say that they had been doing this sort of thing for years, the Author suggested that work-study usually took place after the layout was complete and not, as is this case, before it was planned.

Reasons for the Study

Production had increased since the coreshop was first laid down and, in consequence, the department had, like Topsy, "just growed." Plant had been installed in the first available space, temporary expedients had become permanent features and congestion was so bad that turning a corebox over caused a major upheaval in the vicinity. The need for more floor space was obvious without study, but investigation was required before conceding the foreman's request for another crane, more batch-drying capacity and extra mechanical assistance. This was not to suggest that work-study should usurp the authority of any level of management, but it was generally known that the foreman just did not have the time to make a systematic study of the use of the existing equip-

* Works manager, Osborn Foundry & Engineering Company, Limited.

ment. Some factors which influenced layout were placed outside the range of possible alterations, these included the positions of fixed plant such as stoves, the types and volumes of sands and the several exits for cores leaving the shop. Even these factors were studied and all measures were included which would help to make cores more efficiently.

Results and Measures for Improvement

Sand distribution, using a crane and skip, was poor and a new overhead distribution-platform was built to improve it. Although the average utilization of the shop crane was only 58 per cent., men had to wait, at certain periods, for a lift to help to turn coreboxes over. Each day 8,400 cores were made, of which 6,350 were machine produced, and since the time required to make one ton of cores by hand was six times that required by machine, many more cores, large and small, were put on to machines. To do this, one new core-blower was installed and a moulding machine was adapted to produce large cores. Because floor space was insufficient, the shop was extended and equipment re-arranged. Making some of the larger cores on machines (with turnover/draw units) and siting the machines in the lean-to extension helped to reduce crane loading. Although drying capacity was adequate, utilization of the batch corestoves was poor and too many cores, large and small, were carried to the stoves by coremakers. The provision of racks, filled at the workplace and transported into the batch stove, improved stove utilization and eliminated carrying of many large cores. A pendulum conveyor was installed to transport the smaller cores to the continuous stoves. Coremaking benches were unsuitable and new ones were provided.

Conclusions

The Author said that work-study had made a substantial contribution towards planning an efficient coreshop and he considered that it could be of immense value to managements in making the right decision. Wider use of work-study in the steelfounding industry would greatly accelerate the increase of productivity. These gains could be made at modest cost—in this case the cost of alterations was recovered in 2½ years—and the exercise had shown the practical value to the industry of the Research Association's work.

Steelfoundry Operating Conditions examined by Work-Simplification Techniques

*By P. Lambert, A.M.I.Mech.E.**

The paper was based on the Association's work-simplification studies, made partly to assist member firms to improve materials handling and partly to demonstrate the use of the techniques in steel foundries. The work had been mainly confined to improving the layout of departments, improving working procedures and improving the use of plant and equipment. Four studies had been made in dressing shops, two in coreshops and one in a moulding shop.

* British Steel Castings Research Association.

Dressing Shops

The proportion of time spent on purely handling activities in the four shops ranged from 20 to 29 per cent., in addition, the usual mechanical-handling facilities were in use. Several measures were suggested by which handling costs could be reduced and the first was to reduce the number of movements which castings make, both by shortening the sequences of operations as much as technical considerations would allow and by cutting out unnecessary movements between operations. It was known that some foundries were employing relatively short sequences of dressing operations and that the use of conventional skips for moving small castings was often unsatisfactory. A second measure suggested was to reduce the distance travelled by castings which, in the shops studied, ranged from 2½ to 4 times the length of the buildings concerned. Using the same facilities for several sequences of operations makes flow-line planning difficult, but the minimum total movement for the whole range of production can be obtained by work-simplification techniques. After simplifying sequences of operations and segregating work into types, the third measure suggested to reduce handling costs could be adopted, which is to install handling methods most economical for each class of casting. Examples quoted were conveyors for small castings and jib or monorail hoists for medium-sized castings. Lastly, valuable reductions in handling at individual workplaces could be made by redesigning benches and by the use of simple lifting and holding devices.

Coreshops

In the coreshops also excessive handling was evident, most of it performed by the coremakers themselves, who carried sand to their workplaces and finished cores to the drying stoves. In one case, an increase of 50 per cent. in effective coremaking hours was shown to be possible by relieving coremakers of these and other unnecessary tasks. Difficulties of movement in coreshops due to congestion could often be reduced by better control of corebox storage and distribution.

General Conclusions

Considerable savings in the cost of handling and non-productive work were shown to be possible. When recommending the changes in practice necessary to achieve these savings, the importance of technical considerations was recognized, but the scale of financial reward which might be available demanded critical reassessment of these. As an example, in one firm a reduction in dressing shop time from 65 to 44 hours per ton of finished castings was brought about by reorganization. The

expenditure required was for a new bulk-loading and unloading device to a blast-cleaning machine, 300 ft. of roller conveyor, new benches and enclosures for about 20 operators and a new lifting magnet for an existing crane.

Conference Summary

In summarizing the papers and discussions, Mr. Lloyd first dealt with the general principles of work simplification, what was behind it, how it should be applied and what could be expected to be got out of it. Much had been said about the introduction of the techniques and this was a very important point indeed. Although people were a bit more enlightened than in the 1920s and early 1930s when schemes were often introduced in a senseless and tactless way, it was important to remember that one could never take too-much trouble to bring workpeople into one's confidence at the earliest possible stage. If this was done, the battle was more than half-won. It was true that work-study was "strong medicine" and needed strength and firmness in its application, but, at the same time, it needed the utmost tact and understanding. If some reorganization was intended, the first move should be to call in not only the shop representative, but a full meeting of the workers, to tell them the object of the change, why it was necessary and what benefits were expected from it. Most important of all, the men should be given a firm undertaking at the outset that nobody would be worse off and nobody be made redundant, or that if the labour force was reduced, the people affected would be transferred to another department and receive comparable wages. If managements had the foresight to give these assurances at an early stage, speculation and rumour would be "scotched" and a good deal of trouble prevented.

Consultation

The chairman spoke of his experience of this kind of consultation when, in a recent coreshop reorganization in his firm, changes were made which struck at the common practice of one coremaker performing all operations to complete a core. The exercise could have been very tricky but, by consulting the men beforehand, the changes went through smoothly and were accepted with interest. Referring to incentives, Mr. Lloyd said that there should never be any grounds for suspicion that work-study was to be used to cut rates, except in consultation with the workpeople. They should be shown clearly how it would be possible to produce more for a given effort and, even if the rate per piece was reduced, there should be financial gain for them as a result of the exercise. The co-operation of the unions concerned could be secured if, in these consultations, the acknowledged representatives were given preference and advance information. Furthermore, confidence could be built up by co-opting on to the work-study team a workers' representative—a man from the shop floor. When such a man was shown all the techniques and taken into confidence he could become a very-strong ally.

Size of Department

The size of a proposed work-study section, said the chairman, was difficult to lay down and depended on what the section was expected to do. It should not be overlooked that the field of work-study included maintenance, to prevent the principles of new schemes falling into disuse, and continued improvement, to ensure that schemes installed were developed to full advantage. Further, statistics should be kept of all schemes, firstly to measure the extent of improvements, secondly, to indicate the new production capacity and thirdly, to provide information for costing which would enable any economic advantages to be passed on to the consumer. The maintenance of schemes and collection of statistics relating to them should, therefore, be considered when estimating the size of the section. Whilst mentioning the economic advantages to be gained from work-study, Mr. Lloyd supported Mr. Syme's recommendation that these should be divided three ways—between the shareholders, the workers (including technical and other staff) and, most important (but often overlooked), the consumers.

Incentives

There had been a great deal of discussion on incentives and the chairman considered that the fixing of these should form the last stage in work-study schemes. As to whether they were desirable or not, Mr. Lloyd said that his own rather primitive view was that, as some formula was necessary to raise standard engineering rates to a wage which could be competitive in the labour market, one might as well extend the work-study to include incentives, thus providing the required formula and, at the same time, giving the worker an incentive to increase production. Any payment scheme which was introduced in this way must be relatively simple to understand so that the worker, knowing his output, could easily calculate his earnings in advance. If this was not the case, an incentive scheme was largely wasted. Whenever possible, the incentive payment should be related to the output of the individual, or to that of a relatively small group, but a bonus based on, say, total tonnage from a foundry was merely a method of giving the market value for labour. A modern concept which had been mentioned was that of abolishing the incentive payments, paying a flat rate and trusting the worker to do his best. This was probably a good thing when dealing with the performance of the machine rather than the man, but in the steelfoundry industry this position was reversed. Here the labour content of work was very high and it was a good thing that work simplification done in steel foundries was concerned more with improving human conditions than with equipment and plant. In running mechanized plants, however, the high operating

Work Simplification Conference

costs, which occurred whether the plant ran or not, meant that work simplification was essential to ensure maximum production, thus distributing operating costs over the maximum number of units.

Labour Utilization

Leaving incentives and money matters, the chairman recalled that the importance of studying indirect-labour activities had been mentioned. His opinion was that these were very important, but that they would best be revealed by studying the direct-labour activities. Another contributor to the discussions had said that there did not appear to be much scope for work simplification in jobbing moulding. Mr. Lloyd disagreed strongly and said that studies of jobbing moulding had shown that the percentages of time spent by highly-paid skilled moulders actually doing skilled work was remarkably low. The study of the other duties performed could lead to suppression of many indirect activities. It was most useful and educative to study the way in which moulders spent their time when doing simple floor moulding and if it could be made easier for them to use their skill more fully, the adoption of work simplification would be justified. Flow of material and handling costs had also been mentioned, but the important thing here was the elimination of ineffective handling. If material had to move at all, it should move from one workplace to the next, with no doubling back and no intermediate storage positions. The study of material flow was most rewarding, particularly in fettling shops. In conclusion, the chairman asserted that the steelfoundry industry needed a lot more work simplification. There was no one who could be complacent about conditions in his foundry and great scope was offered for winning back (by lower costs and gains in efficiency), ground lost by the industry to competitive processes. To sum up, the question was not "Can we afford to?" but "Can we afford *not* to?"

SBAC Exhibition at Farnborough

The Society of British Aircraft Contractors Exhibition at Farnborough will be held this year from September 4 to 10. Vacuum melting and casting of steel and the use of an electronic computer to control a billet cut-up line are some of the recent technical advances being featured in the joint display of Samuel Fox & Company, Limited, and Steel, Peech & Tozer, Limited (Indoor exhibition, Stand Nos. 122 and 123). An artist's impression will show the new melting shop under construction at Steel, Peech & Tozer which, with its six 110-ton electric-arc furnaces, is claimed, will be the largest of its kind in the world.

N. GREENING & SONS, LIMITED—Mr. G. A. R. Cameron-Rose has resigned from the board.

Copper-base Ingot Quality Test

Metallurgists on the staff of the French *Centre Technique des Industries de la Fonderie* suggest the following test to ascertain the gas content and metallic oxide-slag and oxides contained in copper-base alloy ingots. The test is carried out using an electrically-heated crucible furnace and accumulating all the oxides, etc., in a heavy covering of borax, so as to exclude any reaction with atmospheric air. The difference between the weight of the charge before and after melting gives the quantity of oxides exchanged between the metal and the borax. Thereafter, there is no need to analyse the oxides separately, their composition or distribution, but simply their percentage.

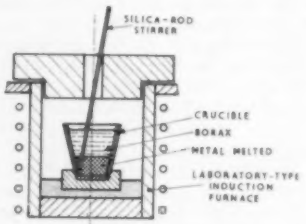

FIG. 1.—*Sketch of the apparatus required for carrying out the melt-under-borax test for impurities in copper-base alloys.*

Apparatus and Method

To carry out this test all that is required (Fig. 1) is an electric furnace, capable of attaining 1,100 deg. C., and carrying a small porcelain crucible. Into this is put about 10 gm. of powdered anhydrous borax. When the borax is melted and heated to 950 deg. C., 10 gm. of ordinary bronze (or 5 gm. of the tin bronzes) is added (carefu' weighing to a 10th of a milligram is essential). The sample is inserted as one solid piece and must be degreased with trichlorethylene before weighing. The furnace is maintained at temperature during the whole of the operation. When the alloy is melted into a globule at the bottom of the crucible—which takes less than a minute—the bath is agitated from time to time with a silica rod. Heating is continued at 950 deg. C. for ¼ hr. The borax, initially perfectly transparent, gradually opacifies. Finally, the crucible is withdrawn and allowed to cool to room temperature. The crucible and borax are then broken, the button cleaned, placed in a desiccator and after a few minutes is weighed. It is stated to be an easy test to carry out and one of proved efficiency.

Following the formation of Crane Fruehauf Trailers, Limited, jointly by Cranes (Dereham), Limited, and Fruehauf Internationtal, Limited, Detroit, USA, directors Mr. GUY CRANE and Mr. JOHN CRANE left on July 9 for a visit to the Detroit, Michigan, headquarters of Fruehauf International. During their 21-day stay they will visit Fruehauf plants throughout the USA.

BSFA Annual General Meeting

Elections and Reviews of Year's Activities

The sixteenth annual general meeting of the British Steel Founders' Association was held at the Connaught Rooms, London, on Friday, July 14, and was presided over by the chairman of the Association, Mr. C. H. Kain, M.I.MECH.E., F.I.M., managing director of Lake & Elliot, Limited, and chairman and managing director, National Steel Foundry (1914), Limited.

The report of the Executive Council on the activities of the Association was unanimously adopted, as were the accounts for the year ended March 31, 1961, which were presented by Mr. F. Rowe (K. & L. Steelfounders & Engineers, Limited), chairman of the Finance Committee.

Election of Officers

Mr. S. L. Finch (Catton & Company, Limited) was elected to the Executive Council, the retiring members being all re-elected, namely, Mr. J. Currie (Blackett, Hutton & Company, Limited), Mr. A. G. Gilbertson (Brown, Lenox & Company, Limited), Dr. R. Hunter (Clyde Alloy Steel Company, Limited), Brig. A. Levesley (Edgar Allen & Company, Limited), Mr. F. N. Lloyd and Mr. M. C. Lloyd (F. H. Lloyd & Company, Limited), Mr. F. A. Martin (Osborn Foundry & Engineering Company, Limited), Mr. D. W. L. Menzies (Bonnington Castings, Limited), Mr. G. M. Menzies (North British Steel Foundry, Limited), Mr. F. Rowe (K. & L. Steelfounders & Engineers, Limited), Sir William Scott (Armstrong Whitworth (Metal Industries), Limited), and Mr. T. H. Summerson (Summerson's Foundries, Limited). Mr. C. H. Kain was re-elected chairman of the Association for a further year, but the office of vice-chairman was left vacant because of the indisposition of the present occupant, Sir William Scott.

Annual Report

The annual report of the Executive Council referred to the considerable reorganization of the Association's internal structure and recorded the acceptance into membership of George Blair & Company, Limited, Tow Law. The Report also indicated the support which the Association had given to the European Committee of Foundry Associations over the past 12 months and, in particular, to the facilities which a member company (F. H. Lloyd & Company, Limited) had made available in connection with the European Foundry Apprentice Competition. The Association's interest in training had caused it to set up its own training committee in May, 1960, under the chairmanship of Mr. F. Shepherd (Head, Wrightson & Company, Limited) and this committee had been "clearing the ground" and assessing the problems facing the industry.

The statistical service which the Association provides for its members had been completely reviewed and an improved and more complete service instituted which, it was announced, would be operative in the current year.

The trade review in the Report showed that orders had increased for the third year in succession and were now back at the level of 1957/58, due largely to an increased volume of business in the first half of the year. In the last quarter, orders had fallen below the level for the equivalent period in 1959/60.

Committee Reports

The Association's Clean Air Committee (chairman, Mr. P. M. Thomas, Wm. Beardmore & Company, Limited) continued to co-operate with the Chief Alkali Inspector on questions affecting the control of fumes from electric-arc furnaces and Tropenas converters. During the year, the Industrial Health Committee has been reconstituted under the chairmanship of Mr. G. R. Shaw (W. Shaw & Company, Limited) and this committee will continue to supervise all industrial health matters and represent the steelfounders' interests on the Joint Standing Committee on Conditions in Steel Foundries, the second report of which will contain a survey by Dr. A. Lisle Punch and Dr. L. G. Blair of the results disclosed by the first five-years' operation of the radiographic-examination scheme inaugurated by the Association. The Report further stated that the BSFA continued to maintain contact with medical officers of member firms and its third conference of works medical officers was opened by HM Chief Inspector of Factories when it was held on September 30, 1960, in London.

The Association's Safety Committee under the chairmanship of Mr. G. R. Shaw had, the Report stated, continued its efforts to reduce the number of accidents in steel foundries and during the year, papers had been presented on this subject at regional meetings of members and at the conference of works medical officers. It was announced that the Association's sound and colour film "Your Eyes are Precious" had been completed and was available free on loan to any interested organizations.

The functions of the Association's Publicity Committee which, during the first half of the year, sponsored an advertising campaign and completed its series of *Bulletins* which began in 1946 had now taken over the Steel Castings Development Committee (chairman, Mr. F. Crerar, W. Shaw & Company, Limited) which had been sponsored jointly by the BSFA and the British Steel Castings Research Association. The first tangible results of this Committee's work appeared when the five data sheets were circulated to about 3,500 engineers, designers and others in March, 1961, on

BSFA Annual General Meeting

the following subjects:—(1) Low-temperature properties of plain carbon steel castings, (2) low-temperature properties of pearlitic manganese steel castings, (3) low-temperature properties of low- and medium-alloy steel castings, (4) magnetic properties of plain carbon steel castings, and (5) fatigue properties of steel castings. Further issues would appear in the coming year, it was announced.

The Committee had circulated copies of illustrated lecture notes on the design and properties of steel castings in March, 1961, to nearly 200 lecturers in technical colleges providing Higher National Certificate, or equivalent, courses.

Publications Received

British and Foreign Specifications for Steel Castings, Part 2. Published by the British Steel Castings Research Association, East Bank Road, Sheffield, 2; price 40s. post free, and $7.50 in the USA and Canada.

It is well to recall that Part I of the Specifications dealt with the requirements for steel castings in Austria, Belgium, France, Western and Eastern Germany, Great Britain, Sweden, Switzerland and the USA. Part 2 covers in a similar way the Commonwealth countries, South Africa, Denmark, Japan and the USSR. The foreword stresses the need for British firms contracting to supply castings to overseas buyers to acquire the relevant specifications, and not to rely on the summaries given in the publication. The latter are given only as a rough guide, set out in relation to similarities which exist in chemical composition, or mechanical and physical properties, or both. Individual inspectors place varying stress and interpretation on what is deemed to be essential, as some of them realize from experience the important points from the users' angles. The two parts give an exceptionally wide coverage and for steel founders undertaking an export trade the purchase of this book is an essential first step.

Research at Battelle Memorial Institute. Published by the Institute from Columbus, Ohio, USA.

Many foundrymen, like the reviewer, know of the Battelle Memorial Institute, but in truth can state but few of its main features. They may know the names of the three directors who have controlled its destiny over the last 30 years, Dr. H. Gillett, Dr. Clyde Williams and Dr. B. D. Thomas, and that a great volume of technical papers have been prepared. What they do not realize is that the Institute employs a staff of about 2,300 people and operates two branch establishments in Europe. Moreover, they will be quite unfamiliar with the wide variety of sciences entering into the Institute's activities. As the original work was metallurgical, it is this side which is best known to readers. This is a well-illustrated brochure, running to 48 pages, and is full of interest for the lay reader in addition to those possessing a scientific backgound. It is difficult from the text to learn whether or not the Institute is a profit-making enterprise, but it is made clear that basically it works for the public good.

European Coal and Steel Community. Ninth Report of the High Authority on the Activities of the Community. Published from Luxembourg.

This 450-page report is of special interest to British readers as much light is thrown on an important section of the Common Market. A chapter devoted to the "Free Movement of Workers" puts the scheme into proper perspective. It is revealed that cards have first to be issued before a man can take up employment in a foreign country and a number of those recorded as issued earlier were to men already in foreign employment. The peak year—1959—saw only 728 such movements, so the net result has been relatively meagre. This is but one of the many interesting activities of the Community with which British nationals should familiarize themselves.

Giesserei-Nachrichten, Vol. 8, Nos. 5 and 6. Published from 5 Canovagasse, Vienna 1, Austria; price 25 Austrian schillings per quarter.

This is a special enlarged edition of the magazine designed to be a guide to the International Foundry Congress recently held in Vienna. It carries messages from Mr. Sans Darnis, the president of the International Committee of Foundry Technical Associations, from Mr. Krammel, president of the Austrian foundry technical institution, and from Mr. Weinberger, president of the employers federation. The various articles printed in the publication well cover the national foundry industry, individual works and processes and the organization and equipment of the Austrian research institute. The advertisements are predominantly German, relieved by one solitary but excellent example from this country.

Years of Challenge. Issued by the British Oxygen Company, Limited, Bridgewater House, Cleveland Row, London, S.W.1.

This beautifully illustrated brochure has been issued to mark the 75th anniversary of the establishment of the company. It is a far cry from the initial work of the firm of supplying the medical profession with a few cylinders of oxygen and the limelighting of places of entertainment to its provision at the present time of tonnage-oxygen plant for the metallurgical industries. The many interesting developments in the uses for oxygen in the intervening period are all recorded by well-written letterpress and impressive pictures. Those responsible for the brochure are to be congratulated on a first-class publication.

Sir John Cass College, Prospectus 1961-62. Published from Jewry Street, Aldgate, London, E.C.3.

This prospectus announces that metallurgical courses covering the requirements of a university degree, the Institution of Metallurgists, the Royal Institute of Chemistry and the City and Guilds of London Institute, are being organized. Some are day courses only, others are designed for evening study. Accommodation is available for post-graduate research and particulars are available on writing to the principal.

AEI Engineering, Vol. 1, No. 6. Published by Associated Electrical Industries, Limited, 33, Grosvenor Place, London, S.W.1.

This issue contains an article on "Marine Propeller Profiling under Electronic Control" by Mr. G. T. Olsen, which carries pictures of the plant installed at the works of the Manganese Bronze and Brass Company, Limited.

How the Foundry Industry serves America; issued as No. 5 of a series of advertisement reprints by the American Colloid Company, Skokie, Ill., USA.

This leaflet outlines the reasons why an iron casting has superseded a weldment for the making of a 7,700-h.p. marine diesel-engine crankcase.

Century of Steel Castings . . .

. . . Historical Survey of the American Steel Foundry Industry

To mark the 100th anniversary of the Steel Founders' Society of America, Mr. Wilson H. Moriarty,* president, was guest of honour at a dinner of the Newcomen Society in North America, held early in the year in Pennsylvania, US. Taking for its subject, "A Century of Steel Castings," Mr. Moriarty traced the history of the US steel-castings industry from 1861 to the present day. What follow are extracts from his speech. Naturally it was prepared for an American audience and makes little or no reference to developments which flowed from overseas.

The American steel castings industry was born in Buffalo in 1861 when the Buffalo Malleable Iron Works poured the first crucible steel castings for the railways. The company is still in existence and is now known as the Pratt & Letchworth Division, Dayton Malleable Iron Company. In 1867, the steel castings industry came to the Delaware Valley with the founding of the second steel foundry, the William Butcher Steel Works in Philadelphia. This foundry, too, made its first castings for the railways. It was not until 1871 that the first company devoted exclusively to the manufacture of steel castings—the Pittsburgh Steel Castings Company—was organized by William Hainsworth to cast ploughshares and other steel castings for the fast-growing agricultural-implement business. Mr. Hainsworth held some 40 Patents and for 12 years after its founding his company made 98 per cent. of all the steel castings in the US.

Even in the 1860's and 70's, there were strong indications that future markets and applications would depend upon the ability to manufacture larger and still larger steel castings, and this required furnaces capable of melting larger quantities of metal. Even though the first commercially-successful melts of open-hearth steel were not poured in the basic steel industry until 1869, the William Butcher Steel Works installed a 3½-ton open-hearth as early as 1871 for producing steel castings. Yet after 92 melts—which had not proved satisfactory—the operation of the furnace was halted. However, in 1875, the Pittsburgh Steel Castings Company installed an open-hearth furnace which proved practical, and in 1876, the Butcher Works (then called the Midvale Steel Works) installed another open-hearth and poured two hammer-dies and a hammer-head weighing over one ton. The introduction of the open-hearth furnace indeed had solved the problem of sufficient capacity.

Relatively few steel castings were poured in these early days, as the work was "hard, heavy and hot." Men stripped to the waist charged the open-hearth furnaces with shovels and it took four or five men three to four hours to hand charge a 10- or 15-ton furnace—to-day a machine does this work and takes less than one hour to charge a 50-ton furnace. The pouring ladle was hoisted by a jib crane located at the side of the furnace, and the moulds (usually arranged in a semi-circle) were poured by swinging the crane from mould to mould. A number of men, applying leverage on large horizontal arms, tipped the ladle to pour the steel into the moulds. Geared safety ladles came in 1867, the first of many steps to take the back-breaking work out of foundry operations.

A Critical Decade

The 1870's was a critical decade for both the wrought steel industry and the steel-castings industry were striving to gain a portion of the iron-producers' market. Now that steel could be obtained in larger quantities, quality became an ever-increasing factor. Improved casting followed the development by A. L. Holley of the introduction of silicon to prevent blowholes. The Midvale Steel Works began producing steel for ordnance in 1875 and the following year introduced tensile testing as a quality-control measure. It seemed as if steel was established as an engineering material when in 1878, for the first time in history, more rails for the railways were rolled of steel than of iron. In 1880, nearly two million tons of steel was produced and by 1890, nearly 4¼ million tons was poured.

In 1884, the Bessemer converter was first introduced into the American steel castings industry, when the Pittsburgh Steel Castings Company installed a 7-ton converter to be used exclusively for steel castings. There was a lot of trial and error and arguments about the relative merits of cast steel and iron, but by 1884, cast-steel wheels for railway cars began replacing iron wheels and the first open-hearth steel was poured on the West Coast. Towards the end of this year, steel from this furnace was used to make castings for the battleship Oregon. The Brooklyn Bridge was completed in 1883 and was anchored with heavy chains fastened to cast-steel anchor plates, each weighing over 10 tons—the first steel castings to be used in (American) bridge building. New markets were taking shape with the invention of the steam shovel in 1883 and the steam turbine in 1884 and steel castings were used early in both these fields. A new and important market was found for steel castings in 1888 when Mackintosh-Hemphill cast the country's first steel rolls at its Fort Pitt Foundry in Pittsburgh.

* Mr. Moriarty is first vice-president of the National Malleable and Steel Castings Company, of Cleveland, Ohio.

Century of Steel Castings

The attempts of the steel castings industry to sell to the ordnance market resulted not only in Midvale Steel Works selling low-carbon steel castings for gun-carriages in 1887, but in greater efforts to improve the appearance of the castings. This company cleaned the ordnance castings with sand and got a smooth surface, and it was claimed that this accelerated the use of steel castings. This may have "sparked" the idea for sand blasting, for such equipment came on to the market around 1900.

Greensand Moulds for Steel

In 1892, a steel foundryman (Jim McRoberts, described as a wild Scotch-Irishman) was given the job of casting 24 steel wheels of intricate design, so peculiar in shape that the wheels would pull apart in the baked moulds then used. The wheels had to be delivered in 24 hours or the order was lost and, in desperation, the foundryman remembered pouring the surplus of a steel melt into an ingot mould of "green" or unbaked sand a year earlier. His fellow workers had taken cover then, for it was well-known that hot metal in greensand would blow and splutter, and maybe explode. A year later, his co-workers again took cover as the foundryman tipped the ladle and poured the hot metal into greensand moulds which had been made from the wheel pattern. To the surprise of those standing a safe distance away, there was no explosion and when the wheels were shaken out, they were found satisfactory in every way. This was a momentous day in steel-casting technology, for greensand moulding did much to solve the problem of shrinkage and made it possible to cast more-intricate shapes.

Manganese and Centrifugal Castings

Another indication of the advancement in the US steel-casting industry in the sphere of railways was the casting of the first manganese-steel crossing "frog," the first frogs being installed in 1894 for street cars. However, it was not until 1900 that steam railways accepted manganese-steel castings. During this decade, other work was done which added greatly to the science of making steel castings. A Chicago foundry poured molten steel into a whirling centrifugal mould and dropped in a quantity of powdered ferro-manganese during the first part of the pouring. As the mould revolved, alloyed metal was forced to the rim, thus giving a harder tread to the railway wheel and leaving the centre tough and machinable. Named after J. C. Davis, this was known as the Davis steel wheel which, by 1911, was carrying 40- and 50-ton freight cars. The Standard Steel Castings Company of Chester (Pa.) made an important contribution to the industry also. In 1893, they cast in steel a number of rear frames for the Rock Island Railroad switch-engines and, later, a complete frame for a Baldwin locomotive. By the 1920s, these frames had become a major steelfoundry product, measuring as long as 34 ft. and weighing up to 62 tons.

Great as the expanded use of steel castings was in the sphere of railways, other uses were being found in ever-increasing numbers. For example, one of the exhibits at the World's Columbian Exposition of 1893 was a mining dredge featuring buckets with cast-steel backs and links poured as a single steel casting, and in 1898, cast-steel shells were used to fight the Spanish-American war. The battleship Alabama, built in 1898, was fitted with an 11-ton cast-steel stern-post, the US battleship Wisconsin, built the same year, had a 5-ton steel shaft-tube, and crankshafts for the US fleet, propeller wheels, rudder frames and anchors were important cast-steel items at the turn of the century.

Twentieth-century Status

By 1900, less than 40 years after its introduction to America, the US steel castings industry had some 85 firms, producing about 158,000 tons of steel castings annually. In 1902, the Steel Founders' Society of America was organised by 17 members meeting at a luncheon club in New York. The 1900s was a new era for the steel castings industry. New equipment came in the form of the Tropenas-type converter, and in 1911, the first electric-arc furnace steel for commercial castings was poured at Treadwell Engineering Company, Pennsylvania. The electric-arc furnace was supplemented by the low-frequency electric induction furnace for special types of steel in 1913, and at the Lebanon Steel Foundry, Pennsylvania, the first melt was poured from a high-frequency electric furnace in 1930. As more and more demands were made on steel castings, new methods of testing and quality control became necessary, and throughout their history steelfounders have used every applicable method of testing as it was developed.

Ships, Ordnance and Water-power

In addition to the railways, the shipbuilding industry needed not only more and better castings, but bigger castings, and as early as 1904, a 34-ton cast-steel shaft-bearing was produced for an ocean liner. An important discovery was made in 1918 by the National Malleable and Steel Castings Company—it solved the riddle of making continuous chain cable as steel castings. In peace and war, steel castings have served the US well; they were found in the early tanks and ordnance of the first world war, and the guns, ships, tanks and even planes of the second world war used steel castings.

The steel-castings industry led in the development of cast-steel hulls and turrets for the big tanks in the last war and to-day, the Cast Armour Committee of the Steel Founders' Society is still functioning, developing new specifications which make to-day's armour vastly superior to that of 20 years' ago. Both the hull and turret of America's newest tank, the 51-ton, M-60, are one-piece castings. At the US's biggest dam, the Grand Coulee, a 30-ton cast-steel impeller wheel is used in each of the 12 pumps needed to move water from man-made Lake Roosevelt to the Grand Coulee Reservoir, 270 ft. above the lake's water level. Columbia Steel Company, where the impeller wheels were cast in the 1940's,

needed steel from two 25-ton open-hearth furnaces to fill the mould of each 14-ft. dia. impeller wheel.

To-day

Steel castings ranging from 50 lb. to 8½ tons, capable of withstanding pressures up to 2,500 lb. per sq. in. and temperatures of about 300 deg. C., are used in the hermetically-sealed "canned" motor-pumps in the pressurized-water reactor systems of nuclear ships and power plants. Steel castings found their place in the construction of the US nuclear-powered fleet and several tons of steel castings were used in building the first nuclear-powered passenger/cargo ship, the N.S. Savannah, now making its test runs. Even in studying the heavens for more and more knowledge of the universe, steel castings will be employed. The giant radio-telescope being constructed in West Virginia will use steel castings in its heavy, but delicate, mechanism.

Steel castings are generally components of larger structures and unfortunately industry seems to concentrate on publicising the more dramatic type of end-product. However, making up these end-products are many components, and steel castings have been used probably more universally than any other engineering material. It is pleasing that from such meagre and uncertain beginnings, the US steel castings industry has grown to one of nearly 2½ million net tons of annual capacity, with some 240 commercial steel foundries providing employment for more than 50,000 persons.

New Patents

(Copies of complete specifications are obtainable from the Patent Office, Sales Branch, 25, Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d.)

842,632. Hooker Electrochemical Company, Niagara Falls, New York, USA.

A new process for the production of a phenolic-resin moulding composition wherein the inert filler particles of the composition are coated with a phenolic-resin composition. There are mixed together, (*a*) the inert filler particles (sand grains), (*b*) a comminuted thermoplastic phenolic resin, (*c*) hexamethylenetetramine in an amount sufficient to render the resin (*b*) thermosetting, and (*d*) a coating agent comprising water and a volatile organic solvent which is a mutual solvent for the resin (*b*) and water. The amount of this solvent is from 35 to 95 per cent by weight of the coating agent (*d*). The ratio of the coating agent (*d*) to the resin (*b*) is between 0.1:1 and 2:1. Mixing is continued until the resin-coated sand-particles become dry and free flowing.

842,687. H. J. Daussan, 9 Avenue Leclerc de Hautecloque, Metz, Moselle, France.

Improvements in, or relating to, a method and device for treating an ingot or casting in the course of its solidification in the mould. The cooling of the top surface of the poured metal is controlled so that the solidification progresses radially towards the centre of the surface. A cooling effect is produced mainly on the peripheral and annular portion by evaporation (under the effect of the heat of the metal) of a liquid given by the cooling agent (such as an aqueous solution of sodium silicate) supplied over or on the peripheral portion—without the possibility of violent contact with the poured metal.

843,040. Wolverhampton Die Casting Company, Limited, Graiseley Hill Works, Graiseley Hill, Wolverhampton.

Die-cast ladies' shoe heels, made of aluminium- or zinc-base alloys.

843,056. E.M.B. Company, Limited, Moor Street, West Bromwich, Staffs.

Die-casting and injection-moulding machines which are stated to have simple hydraulic control, and which can be readily adjusted to meet different working conditions.

843,064. United States Steel Corporation, 525 William Penn Place, Pittsburgh, 30, Pennsylvania, USA.

Improvements in vacuum-casting apparatus—in particular the Patent relates to an improved evacuatable tank or chamber adapted to the casting of large ingots.

Australian

Photostat copies of Australian Patents are available from the UK Patent Office, price 9d. per page. The address given, unless otherwise specified, is that of the agent for service.

228,966. Industrial Foundry Materials, Limited, and Hiram H. Williams, Limited, c/o Phillips, Ormonde Le Plastrier and Nelson, 34-41, Queen Street, Melbourne, Victoria, Australia. (11 sheets.)

A shell-moulding machine wherein a comminuted mixture of refractory material and a bonding agent is forced under pressure into contact with a heated patternplate. The invention is intended to provide means whereby the sequence of operations relating to the blowing of the moulds, is effected automatically in timed relationship.

229,096. Mond Nickel Company, Limited, c/o Phillips, Ormonde Le Plastrier and Nelson, 34-41, Queen Street, Melbourne, Victoria, Australia. (6 sheets.)

Turbine blades or other articles subjected in use to stress at elevated temperatures, cast in an alloy containing molybdenum 6 to 10, chromium 10 to 35, aluminium 4 to 8, titanium 0.1 to 5, niobium 0.1 to 5, boron 0.001 to 1, iron 0 to 25, zirconium 9 to 2 per cent.—the remainder being substantially all nickel (the nickel content being at least 40 per cent).

229,118. Foundry Equipment, Limited, c/o Sprnson and Ferguson, Caltex House, Kent Street, Sydney. (18 sheets.)

Foundry mould assembly. The invention is especially concerned with the assembly of a cope mould and a drag mould formed in a machine such as the jolt/squeeze type, into a single mould unit.

229,274. D. F. Ednell, c/o Edwd. Waters and Sons, 422-428, Collins Street, Melbourne, Victoria. (8 sheets.)

Method and apparatus for the production of refractory moulds for casting metals. A mixture of refractory fibre, and possibly solid finely-ground fire-proof material and a binder agent, is suspended in a liquid. A perforated model mould is dipped into the suspension, the mould then being subjected to air pressure so that the suspended mixture is pressed on to the model mould until a mixture layer of desired thickness has been deposited. After this, the model mould with the coating is lifted from the suspension to final containers.

Equipment & Supplies

Mould Dressing

Foseco, Limited, Drayton Manor, Tamworth, Staffordshire, have placed on the market a new material Terrapaint 55, which has been developed by the firm's laboratories in collaboration with the staff of the British Steel Castings Research Association for mould dressing. A coloured film shown during an "open day," which was attended by staffs of the leading steelfounders of the country, demonstrated the effectiveness of the material (a) during the drying process, (b) under intense heat and (c) in relation to the skin of finished castings (an example is shown in Fig. 1).

[Courtesy of F. H. Lloyd & Company, Limited, Wednesbury.]

FIG. 1.—*Part of a rim sprocket casting* 45-*in. dia., weighing approximately* 3 *cwt. (cast in alloy steel), for which the mould was dressed with Terrapaint* 55.

The new material carries a high refractory solids content per unit of volume, giving good covering power and protection; quite thick, ¼-in. or so, coating can be applied on the mould in one application and one drying cycle, it is claimed.

Contour Milling Machine

To meet the increased demands for high-accuracy contour milling at the Woodside (near Leeds) works of the engineering division of British Oxygen Company, Limited, a new 16-ton Blackburn contour milling and die-sinking machine has been installed. The machine is said to be capable of reproducing any number of identical three-dimensional forms from a single pattern in wood or other material, and to handle work pieces up to 54 in. by 42 in. in area, and 18 in. deep. Control is from a desk aboard the horizontal travel platform. Work designated for the new installation includes the reproduction of all-metal aircraft models for wind-tunnel testing at the Royal Aircraft Establishment at Farnborough and elsewhere.

Peat. New factory for conversion of peat into Berkoal, used as an additive to foundry sand, has been opened at Drogheda, S. Ireland, by Alluvial Products (Ireland), Limited. (F. W. Berk & Company, Limited, Berk House, 8, Baker Street, London, W.1, are responsible for world distribution of this product.) The factory was opened recently by Mr. Erskine Childers, T.D., Irish Minister for Transport and Power, who was welcomed at Drogheda by Mr. Desmond Siberry and Mr. S. G. Henderson, directors of Alluvial Products (Ireland), Limited, and by Mr. B. E. Mileham, director of F. W. Berk & Company, Limited. Guests at the ceremony included the Mayor of Drogheda, the Meath County Manager, the managing director (Mr. D. C. Lawlor) and other high executives of Bord na Mona, and representatives of the Drogheda Harbour Board, Chamber of Commerce, and of the Customs and Excise, C.I.E., and Government Departments. The present plant has a capacity of 6,000 tons per year; within two months a second unit, bringing the total capacity to 12,000 tons a year, will be installed and pilot plant at Birkenhead will be shut down.

Dust-control Installation.—Dallow Lambert & Company, Limited, Thurmaston, Leicester, announce that two size MG 80 wet Dedusters have recently been installed at the foundry of Aluminium Bronze Company, Limited, of Walsall. Factors affecting the choice, it is stated were (1) the fact that dust from aluminium-bronze and aluminium castings has explosive properties, and (2) the resultant sludge emitted from the collection plant has only a low water-content and is thus acceptable to the firm's waste-product refiners. Two self-contained units, each of 8,000 cu. ft. of air per min. capacity and with 30-h.p. motorized fans and drag-link sludge-ejectors, were installed.

Degreasing. Industrial Colloids, Limited, Viaduct Road Works, Altrincham, (Ches.), announce that their Colosyl W.X. solutions have been successfully used for the cleaning of steel bales, made up of pressed turnings and swarf, and intended for melting furnaces. In laboratory tests carried out, the company claims that immersion of these bales in an 8-oz. Colosyl W.X. crystals to a gallon of boiling-water solution has completely degreased the bales, making them suitable for delivery to foundries in smokeless zones.

Cut-off Machine. Pee-Cee Engineering Supplies, Limited, 115/119, West Street, Bristol 3, have designed and placed on the market a cut-off machine to be known as the Portacutta. It is of light-weight construction and can be carried to the job. The power unit is of Black & Decker manufacture, and arrangements have been made for the latter firm to undertake servicing at their many stations.

Ladle Drying. Preheating and drying of 60- to 80-ton pouring ladles at the Bynea Steelworks, Limited, Loughor, Carmarthenshire, has been simplified and reduced from eight to two hours by a new heating device using a propane heater specially developed by the British Oxygen Company, Limited. Previously coal fires were burned inside the ladles.

THE METAL FINISHING DIVISION of the Pyrene Company, Limited, Great West Road, Brentford, Middlesex, announce the introduction of a new strippable material for the walls of paint-spray booths. It has been given the name of Putac No. 2.

Crane Hooks and Attachments

Practical Points designed to Promote Foundry-floor Efficiency

By "Jacques"

Last year a leading article in the JOURNAL* on ergonomics, after a survey on the subject given at a London conference, pointed out that, ". . . the question boils down to labour saving—both mental and physical—by a scientific commonsense approach to the accomplishment of human work." It is stated, "Probably no industry has more need of ergonomics than the foundry industry." Further on it adds, "A tenet of ergonomics is that the positioning of levers, press-buttons and handles should be such as to demand a minimum of effort on the part of the operator. . . ." Crane hooks in the majority of applications meet the requirements intended of their respective functions, but for certain foundry operations the design and size of the hook sometimes leaves room for improvement—a point rarely dealt with in the handbooks.

Accidents

Difficulties are often met with in the method of attachment of hooks to ladles, where the bow section does not readily "mate" without careful positioning of both. An analysis of foundry casualties recently studied by the Author brought to notice a high percentage of nipped fingers and blackened nails in the course of a year. Careful checking showed these were associated with the "hooking on" of the smaller loads, and highlighted the size of the hooks and the hand method of attachment.

* October 13, 1960.

FIG. 1.—*Very common type of attachment with the crane-hook mating on a rectangular-bar bow.*

Types of Hooks

The 5- and 10-cwt. pouring ladles, scrap buckets, tipping skips and other mobile services were generally fashioned with bows from 2- by 1-in. flat bar. Reference to Figs. 1 and 2 shows the bow and crane hook in position on a five-cwt. pouring ladle. To attach the small hook to this type of bow with a full ladle of metal was a matter needing constant practice, to say the least, with the lowering and hoisting of the hook to the precisely-correct position. Fig. 3 shows how much of the difficulty may be overcome by employing a double type of hook which will almost attach itself. Double hooks have proved very suitable for all the lifts on both hand-ladle and main telpher-ladle services.

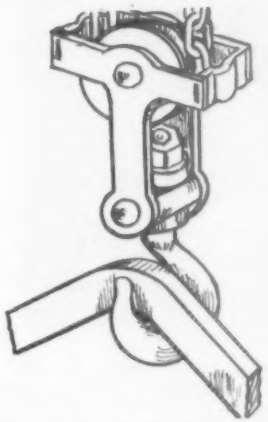

FIG. 2.—*Sketch of arrangement depicted in Fig. 1. Considerable "knack" is required for easy handling of this basic design of lifting hook.*

FIG. 3.—*Double-hook inserts form an easily adjustable link between the crane-hook and the lifting-bar of the ladle. A simple adaptation making for smoother handling.*

Fig. 4 shows a useful type of hook for a one-purpose air-hoist lift used with five-cwt. small mould-pouring ladles, the swivel guide handle will

FIG. 4.—*Greater flexibility is achieved when attaching this air-hoist by the use of the swivel-guide-handle.*

be noted; hooking on and off was positive and safe every time with this arrangement.

The cupola-charging bucket in Fig. 5 shows an early loose-ring arrangement which requires two hands to attach, one to guide the hook and the other to hold the ring vertical.

FIG. 5.—*Loose-ring fitted to the cupola - charging bucket requires two operators to manage.*

With a rash telpher driver—40 ft. up—a second helper was necessary to signal, but with practice head nodding was understood and considered safe. Fig. 6 shows the more convenient method later adopted to provide a safe and wide-tolerance attachment. Moreover, the telpher driver with practice could disengage or hook-on without floor-level guidance and deal with a row of charging skips in their turn.

There appears to be scope for an extra optional guiding "eye" to heavy-duty crane hooks, as shown in Fig. 7, to provide safe and easy attachment. Often the lifting chains themselves weigh several hundred pounds and such lifts require the closest

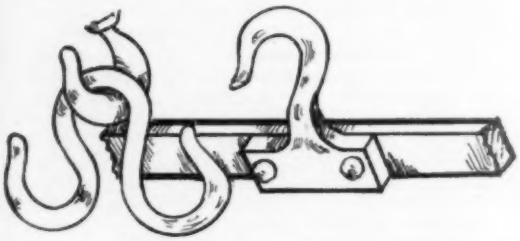

FIG. 6.—*Replacement of the clumsy arrangement depicted in Fig. 5 by the flexible double-hook enabled this lift to be made by one instead of two men.*

understanding between the crane driver and the hooker-on; therefore, in these and a number of other cases only skilled slingers are permitted to carry out lifting operations.

The above examples indicate that in a number of instances equipment can be advantageously simplified with an increase in efficiency and safety, thus illustrating a simple application of ergonomic principles to foundry practice.

FIG. 7.—*Additional eye facilitates the safe attachment of the heavier-type of lifting-crane hook.*

It is pointed out that detailed recommendations with regard to crane hooks, chains, and slings is given in BS.462:1958—EDITOR.

HARLAND & WOLFF, LIMITED.—Mr. A. O. Milne, general manager of the repair works, has been appointed to the board.

Grey-iron Specifications—Survey of Present Usage (in America)

*By H. W. Lownie Jnr. and C. F. Walton**

At the February meeting of the American Society for Testing Materials, the A-3 committee on cast iron suggested that a survey should be carried out in (American) foundries on the subject of specification usage. Through the co-operation of the ASTM and the Gray Iron Founders' Society, a questionnaire was sent to 2,200 grey-iron foundries in the US and Canada and the following information, derived from the replies received, was reported to the Society's committee by the Authors named above, at a recent meeting.

A total of 454 ironfoundry concerns completed and returned questionnaires recently submitted to them by the American Society for Testing Materials—about 20 per cent. of the total number circularized. As the answers were received, they were tabulated and analyzed in groups of 100, the resulting analyses on each block of 100 returns being about the same as those for the entire sample. There were 383 useful reports of tonnage, the distribution being as follows: Range of melt size, 1 to 12,000 net short tons per month; average melt, 410 tons per month; median melt, 150 to 200 tons per month; distribution of melt, 55 per cent. of foundries melt 200 tons per month or less, 35 per cent. 201 to 800 tons per month, and 10 per cent. over 800 tons per month.

Types of Specifications Used

Founders were asked to indicate which of 10 specifications were called for by their customers; the results were as shown in Table 1.

TABLE 1.—*Numbers of Foundries Called Upon to Meet Various American Specifications.*

American Society for Testing Materials	334
Customers' private specification	237
Society of Automotive Engineers	131
US Military and Navy	94
Federal	88
American Water Works Association	31
American Standards Association	21
American Society of Mechanical Engineers	17
American Association of State Highway Officials	5
Canadian Standards Association	3
Other	13
No specifications called for	47

The results indicated the wide use of ASTM specifications by castings buyers, and it was estimated that 88 per cent. of the founders circularized were asked to meet ASTM specifications on at least some castings. About 60 per cent. of founders were called upon to meet non-standard specifications imposed by some of their customers and only about 12 per cent. of those who replied did not have to meet some type of specification established by an outside agency.

Use of ASTM Specifications

Founders were asked to indicate the percentage of their production which was made to some ASTM specification and from this information it was learned that half of the founders replying made 20 per cent. or less of their iron to ASTM specifications and half made more than 20 per cent. to these specifications. Of the total tonnage reported, the surprisingly high average of 31.3 per cent. was ordered to ASTM specifications. For the industry, this amounted to an average of between one and two million tons per year—an amount at least equal to the total annual sales of all types of steel castings.

Major Specifications

In the questionnaires sent out, founders were also asked which of the six major ASTM specifications they were called upon to supply, no attempt being made to determine the frequency of use of specifications not included. Results were as indicated in Table 2.

TABLE 2.—*Usage of Six More-important ASTM Specifications.*

	Called for regularly.	Called for occasionally.	Never required.	Total.
A 48—" Grey-iron castings "	183	129	50	362
A 159—" Automobile Grey-iron Castings "	51	73	117	241
A 278—" Grey-iron castings for Pressure-containing Parts "	18	50	147	215
A 319—" Grey-iron castings for Elevated Temperature for Non-pressure-containing Parts "	10	44	152	206
A 190—" Lightweight and Thin-section Grey-iron Castings "	12	19	178	209
A 438—" Transverse Testing of Grey Iron "	2	10	172	184

Mechanical Tests for Specification A 48

Founders were asked the nature of the tests made to ensure that the iron made met respective ASTM designations and five choices were given, tensile, transverse, chemical, chill and hardness test. On the matter of mechanical tests, it was found that 134 of the founders used the tensile test only (34 per cent.); 23 the transverse test only (6 per cent.); 99 the tensile and transverse tests (25 per cent.), and 142 employed no mechanical

* The Authors are respectively division chief, Battelle Memorial Institute and technical director, Gray Iron Founders' Society.

tests (35 per cent.). From this information it was disclosed that at least 35 to 41 per cent. of the founders replying admitted to failure to make the specified mechanical tests. Of the 59 to 65 per cent. who claimed to make the tests, there remained the question as to whether the tests were made under the conditions specified and with the specified frequency.

The results of tests in the "optional" category (made solely for internal control) were that 221 foundries (53 per cent.) carried out chemical testing, 172 (44 per cent.) chill testing, and 177 (44 per cent.) hardness testing, but most surprising in this analysis was the fact that 105 foundries (26 per cent. of the total) said they made *none* of the five tests listed. In contrast to this, 49 foundries (12 per cent. of the total) stated they made all five tests.

Types of Test-bars

Another question in the survey carried out asked what type of test-bar was cast and when was one used. The question dealt with a casting with a wall ¼-in. thick and the correct answer (according to specification) was ASTM A 48 Type A test-bar, cast in a dry-sand mould or in a core. The results received were as given in Table 3.

TABLE 3.—*Test-bar Adoption by Ironfounders.*

Type of test-bar.	No. of foundries.		Percentage.
	Greensand mould.	Dry-sand mould.	
Type A—short	3	5	3
Type A—medium	21	27	16
Type A—long	41	51	30
Type B—short	6	8	5
Type B—medium	17	28	15
Type B—long	18	30	16
Non-standard	20	27	15

Although specification A 48-60T called for the foundry to cast test-bars in dry-sand moulds (or cores), it was found that 42 per cent. of the founders replying used greensand. Specification A 48-60T recommended a short, type-A bar cast in dry-sand and—using this strict interpretation of the specification—only 2 per cent. of the founders complied. Using a very liberal interpretation of the specification and assuming that the necessary agreement was obtained with customers, one could say that any type-A or type-B bar cast in dry-sand would meet the requirements, but even on this liberal basis, only half of the founders circularized complied with the specification. Finally, 15 per cent. of the founders carrying out mechanical tests did so on test-bars not described in the specification.

Exceptions to Standard Specifications

One question in the study carried out endeavoured to determine how great a problem existed as a result of special requests by customers. It was found that about 49 per cent. of the founders reported that they had no requests for exceptions to standard specifications, thus suggesting that the deviations in test-bar practices were the founders' doing, not the customers. About 34 per cent. of the founders did report requests for "specials" and "exceptions," but believed that these caused them no special problems. Finally, 17 per cent. (68) of the founders stated they had troublesome special requests, but these were concentrated mainly in the larger concerns.

Special problems and exceptions receiving the most frequent mention as "trouble-spots" were: (*a*) Requirements dealing with microstructure; (*b*) requirements for narrow hardness-tolerances on castings; (*c*) requirements for unrealistic ratios of hardness in castings to strength in test-bars; (*d*) requests for notification of test-bar results; (*e*) orders for trade-named irons with no description of the iron; (*f*) lack of customer understanding of the effect of section size, and (*g*) special alloying.

Foundry Comments

Although the statistical information derived from the questionnaires was informative about the average founder's compliance with specifications, equally enlightening were the comments offered in writing by some founders on the questionnaires, and samples are quoted in what follows:—

Speaking of test-bars, "we would talk our way out of this one." "Please send us a copy of ASTM specifications" (this founder reported (strangely enough) that 50 per cent. of its iron was ordered to ASTM specifications). "What is A 438?" "Our routine chill-test is good enough—no tensile test made even when specified." "Impossible to make class-40 iron in ¼-in. wall." "I have no idea what these specifications are." "Too many customers ask for iron to ASTM specifications." "Specifications should be standardized." "We do the best we can," and "Most of our customers have replaced castings with weldments."*

* Presumably, this would be one of the last business letters this foundryman wrote—Editor.

National Trades and Technical Societies

Mr. William Burrows, head of the engineering department of the Wombwell High School, South Yorkshire, has been appointed the first national development officer of the National Trades and Technical Societies, which have their headquarters at Sheffield. The appointment has been made possible because of a grant of £16,250 from the Nuffield Foundation to the organization. He will visit industrial areas seeking support from industry for the Societies and in starting new branches will enlist the interest and help of the local education authority. Before entering teaching Mr. Burrows was an electrical engineer with Firth-Vickers Stainless Steels, Limited. The National Trades and Technical Societies was founded in Sheffield in 1918 and now has a membership of 8,000 spread throughout many parts of the country. It is concerned to encourage workmen to take an interest in the technical side of their trades and to improve their skills. The grant covers five years and is stated to be to help the Societies to further education for adult workers in industry.

Italian Patternmakers Visit to Wadkin

During the recent visit of Italian Patternmakers to the UK as guests of the National Society of Master Patternmakers a trip was made by them to the works of Wadkin, Limited, pattern-making-machinery specialists of Leicester. The accompanying photograph shows a few of the visitors in the works accompanied by Mr. E. C. Rowen, the NSMP president. The group includes on Mr. Rowen's right, Mr. M. Garino, leader of the Italian party, and next to him are, Mr. Vasey, Wadkin export manager, Mr. Glover, patternshop foreman, and (left) Wadkin's demonstrator.

Union's View on Holiday Work

Leaders of Sheffield's engineering unions take a poor view of "pin-money men" among their members who seek casual employment during the city's holiday fortnight instead of downing tools, and all shop stewards in the Confederation of Shipbuilding and Engineering Unions have been told to report any cases. These will be reported to their union and the men face possibly expulsion or a severe fine.

Last year several hundred men worked in the holiday fortnight for maintenance contractors called in at steelworks in the city and some of them, after working long hours of overtime, earned as much as £60. Commenting on this factor, a union official said, "The men went back to their own firms looking tired and stale—hardly a condition in which they could reach maximum efficiency. It is not fair to their employers or to their workmates."

The district chairman of the Confederation, Mr. George Candelet, said, "Holidays are given to refresh people for another year's work. We are now pressing our claims for a three-week holiday. These claims are endangered by people who throw up their existing entitlements and take extra work."

Dust-free Coke

Coke users in and around Wolverhampton will get speedier deliveries and a guarantee of high quality as a result of a £20,000 modernization scheme completed at the Wolverhampton works of the West Midlands Gas Board, a news conference has been told. The money has been spent on a screening plant which is already in operation and which ensures that the coke is dust free and of a useable size. The installation of automatic weighing and bagging equipment will enable six lorries to be loaded each hour instead of one. Two of the machines are capable of supplying over 2,000 one-cwt. bags of coke daily.

Mr. D. Maddocks, area coke manager, said that consumers in Wolverhampton, Shrewsbury, Wellington, Dudley, Tipton and Stourbridge would now be able to buy tested coke. Until about four years ago 75 per cent. of the division's coke had gone to industrial users, but last year domestic deliveries went up by 25 per cent. and in the first 13 weeks of this year the increase was again 25 per cent. Declaring that coke to be satisfactory had to be burnt on approved appliances, Mr. Maddocks said ¼-in. in the width between grate bars could make a great deal of difference.

Alston Foundry Long-service Awards

The first presentations of long-service awards were made at Alston Foundry Company, Limited, on Friday, July 14, to two employees who have been with the company since it was formed in 1941. The presentations were made by the chairman, Mr. James Steel, to Miss K. Hudspith and to Mr. R. Hodgins. Also in the picture are the directors of the company, Mr. T. A. Cosh, Mr. R. Carr, Mr. H. Holdsworth and Mr. J. Cameron.

American Letter

Current Unemployment in the US

According to the US Labour Department, unemployment fell by 533,000 in April to 4,962,000, the seasonal decline for this time of the year. The number of employed at May 13 was 65,734,000, at May 6, 65,516,000 and 66,159,000 a year ago. On the other hand, the number of unemployed at May 13 was 4,962,000, at May 6, 5,495,000, compared with 3,660,000 a year ago. Detroit, the centre of the automobile industry, led with nearly 12 per cent. of its labour-force out of work, the biggest shake-out of men in the slump occurring in the 25 to 44 age group—regarded as a worker's peak-productivity period. The US Administration's proposal to increase the minimum wage from $1.00 to $1.25 per hour is likely to make employment recovery temporarily more difficult.

In February, 1961, when, according to some Government surveys, general unemployment approached 7 per cent. (or 5,400,000) of the work-force, the following unemployment rates for certain groups prevailed: common labour, 19 per cent.; boys between the ages of 14 and 19, 18 per cent., and men between the ages of 20 and 24, 14 per cent. Most of these procured work at about the present minimum of $1 per hour and the new provisions of the proposed Minimum-wage Bill could actually create more unemployment. When wage costs and prices rise during a recession and unemployment mounts, it is evident that wage rates are too high in many industries to permit maximum employment.

What is Unemployment?

It should be remembered that in the US, the unemployment total is derived by a survey of 30,000 units. There could be many errors in the result obtained from this method, but the procedure has the approval of US labour leaders and serves as a general index. In many countries, only those registered as unemployed are counted, but in the US, anyone aged 14 years or over who says he (or she) would like to work is considered unemployed. (This could include Aunt Sue who hasn't worked for 30 years or old Uncle Bill who would like to make some extra pocket-money!) The facts are that in February, out of 5.4 million represented as unemployed, 674,000 had been unemployed for six months or more, an additional 950,000 for 15 to 26 weeks, and those unemployed for a period of less than five weeks totalled over two million.

The figure of 5.4 million persons unemployed sounds alarming until fractional unemployment is recognized as a natural phenomenon in a free economy dependent upon how consumers exercise their freedom of choice. This has led to a more recent tendency in the US to define 4 per cent. unemployment—on the basis quoted earlier—as equivalent to "full employment." The 4 per cent. value means that with a civilian labour force averaging around 72 million persons, perhaps 3 million persons would be unemployed at a time when work opportunities were abundant, and not 5.4 million.

In 1947/48, the 96 per cent. "full employment" level was reached in the US and surpassed during 1951/53, when with 1½ million young men called into the armed forces, inflationary pressures built up price-levels and brought on price controls. The Government's proposal to raise the minimum wage by 25 per cent. "sets the stage" for future increased costs which will ultimately affect the foundry industry of America.

Foundry Labour

Most US foundry labour is attached to unions, as is the case with most industrial activities, and whilst it is not likely that "unionized" labour profits immediately from Government decree, the affect of the decree on organized labour will be to build up an underlying pressure to increase wages against a rising cost of living (living costs raised by the decree). Organized labour regularly proclaims that wage improvements can be made out of profits without price increases, but in the US, organized labour seems to be reluctant to forego any threat to the profits of its members when a basic law tilts the labour profit to an unfavourable balance. Therefore, labour costs, price increases and inflation are bound to follow in inevitable sequence.

For a time, business will be stimulated as inventories are fortified and forward purchases are made against the impending rise in prices; US foundrymen can expect higher costs and their customers higher prices. Gradually, however, this stimulus will wear off and must be replaced. The normal progress of invention, expansion, obsolescence and replacement in a country with a limited export market follows a steady trend and new outlets for available labour must be found and incentives for replacing obsolescence provided. Thus the US long-term labour problem is in urgent need of co-operative labour/management adjustment.

Battersea Summer School on Corrosion

The metallurgy department of the Battersea College of Technology has announced details of its eighth summer school on corrosion, to be held from September 25 to 28. The Course, under the title "Corrosion Problems in the Electrical-power Industry," has been arranged in conjunction with the Corrosion Group of the Society of Chemical Industry, and will deal with corrosion as it affects each stage in the generation of electrical power. Dr. E. C. Potter, B.SC., F.R.I.C., D.I.C. (head of the boiler corrosion section, Central Electricity Research Laboratories), will present an introductory lecture, and other papers organized are as follow: "Furnace-side Corrosion," by W. D. Jarvis; "High-temperature Water-side Corrosion," by Dr. E. C. Potter; "Corrosion of Cooling Surfaces," by Dr. P. J. Gilbert, B.SC., F.I.M.; "Corrosion of Feedline Surfaces," by Dr. J. T. Harrison, B.SC.; "Corrosion of Turbines," by M. G. Gemmill, B.SC., A.I.M.; "Corrosion in Transmission and Distribution," by H. G. Masterson, M.A., B.SC., and "Boiler Feedwater," by H. J. Fortune, B.SC. It is hoped to arrange a visit to the Central Electricity Research Laboratories at Leatherhead, Surrey, on Thursday, September 28.

The fee for the Course is £10 (including luncheon, morning and afternoon refreshments) and enrolment forms may be obtained from the Secretary (Summer School), Battersea College of Technology, London, S.W.11.

Industrial Water & Effluents Group

A new subject group of the Society of Chemical Industry is being formed under the chairmanship of Dr. B. A. Southgate, director of the Water Pollution Research Laboratory of the Department of Scientific and Industrial Research. The new "Industrial Water and Effluents" group will be interested in all aspects of the science and technology of treatment, conservation and economic use of water and of the treatment and disposal of effluents. A programme of meetings is being arranged for the 1961/62 session, the first of which will take place on November 1 at the Royal Institution, 21 Albemarle Street, London, W.1. Anyone interested in becoming a member is invited to write to the general secretary, Society of Chemical Industry, 14 Belgrave Square, S.W.1, or to the Industrial Water and Effluents Group Secretary, Mr. J. L. Hewson, Imperial Chemical House, Millbank, S.W.1, from whom further particulars and membership application forms may be obtained.

"Housewarming" at John Thompson, Limited

John Thompson, Limited, of Ettingshall, Wolverhampton, a firm which began more than 135 years' ago as makers of iron canal-boats and primitive boilers, celebrated the opening of their new offices at Tavistock House East, London, last week with a housewarming party. To-day, the group is one of Britain's foremost in the fields of boiler-making, general engineering and nuclear-power-station development and embraces no fewer than 29 companies with factories in this country and various parts of the Commonwealth.

The new offices of John Thompson, Limited, mean that for the first time in the firm's long history, the complete London sales organization can now be centralized. In the new offices, a room has been set aside to display photographs and models of the main products of the group, including steam boilers of all types, water-treatment plant and instrumentation, pressure vessels and special fabrications for chemical plants, oil installations, ash and dust and material-handling systems for power-stations and industry and pipework fabrications. The new building forms a new east wing to the extensive Tavistock House of the British Medical Association. Internally, the floor area has been divided into offices by steel partitioning and throughout there are acoustic-treated ceilings, incorporating radiant heating and flush lighting. Wolverhampton remains the head office of the group and for the majority of individual firms, but among the companies which have recently entered the John Thompson group and are represented in the new London office, are Thompson Brothers, Darham Industries, John Thompson Compost Plant, Limited, and Thompson-Tappan.

Throughout the period, John Thompson have operated their own foundry to serve the engineering shops and this—situated at the Ettingshall works, near Wolverhampton—has been recently modernized and extended. Iron castings are now produced up to 18 tons, the foundry employing about 150 on the shop floor and producing over 100 tons per week. Of two main bays, one is 400-ft. long by 60-ft. wide, and the other, 300 by 40 ft. Although the foundry has grown with the main company, until recently, it was only used as a service department. Nowadays, however, increasing amounts of castings for outside customers are being undertaken, especially in the field of large diesel-engine work. Sandslinging, the CO_2 Process, and other modern methods, are being adopted and only this year, the firm engaged another 20 moulders.

Electromagnets' £60,000 Extension

Nearly 300 guests, representing suppliers, customers and contractors, attended the official opening ceremony on July 12, of Electromagnets, Limited's new works and offices at Hockley, Birmingham. The new buildings, which have been specially designed to suit the company's requirements as manufacturers of magnetic-separating and handling equipment, will give greatly improved conditions and facilities for the development and production of the company's equipment, and the new extension provides a large new machine-shop, despatch area, administrative offices and showroom. The extension, which entailed the conversion of a former bombed site at a cost of £60,000, is "across the road" from the older premises.

Extension of the premises at Hockley, Birmingham, of Electromagnets, Limited. The older part of the company's premises is on the left of the photograph.

[*Photograph by kind permission of the Birmingham Post.*]

Welding Institute's Officers

Mr. Harry West, M.SC., M.I.MECH.E., M.I.E.E., managing director of AEI (Manchester), Limited, was installed as president of the Institute of Welding for 1961/62 at the annual general meeting on July 13. Two new vice-presidents also took office, Mr. C. Humphrey Davy, M.I.MECH.E., director of Babcock & Wilcox, Limited, and Mr. L. Redshaw, M.ENG., M.R.I.N.A., deputy managing director of Vickers-Armstrongs (Shipbuilders), Limited. The following were elected to the Council of the Institute: Mr. E. V. Beatson, B.SC.(ENG.), Mr. M. Birkhead, A.MET., Mr. V. W. Clack, A.M.I.MECH.E., Mr. A. Evitts, Mr. S. H. Griffiths, F.I.M., Mr. J. Hooper, Mr. J. McLean, and Dr. R. Weck, M.I.C.E., M.I.MECH.E.

Bromford Iron & Steel Company's Developments

On July 18, the Bromford Iron & Steel Company, Limited, Bromford Lane, West Bromwich, Staffs, officially opened their new cold-rolling mill and fabric mesh reinforcement factory. The guest of honour at the opening ceremony was the Rt. Hon. Frederick Erroll, M.I.E.E., A.M.I.MECH.E., M.P., Minister of State, Board of Trade. In his address of welcome to the Press, Mr. C. Cooper, chairman of the company, reported that by July 18, the month's exports had totalled 870 tons of steel in various forms to customers in fifteen countries, and it was confidently expected, he said, that exports for the whole month would exceed 1,000 tons.

News in Brief

A CONTRACT for truck and bus chassis valued at over £150,000 has been placed with Albion Motors, Limited, Glasgow, by the company's new agents in Nigeria, B.E.W.A.C., Limited.

THE NEW £1,000,000 EXTENSIONS to the factory of United Non-Ferrous Metals, Limited, Glover Street, Birmingham, was opened last week by the Lord Mayor, Alderman E. E. Mole.

THOMAS SMITH & SONS (RODLEY), LIMITED announce the appointment of Mr. E. P. Cook of 61, Cleveland Avenue, Stokesley, Middlesbrough, as resident sales representative in the North East.

FULL DETAILS of the 53rd autumn meeting of the Institute of Metals which is to be held in Brussels from September 18 to 22 this year, are obtainable from Mr. R. E. Moore, the secretary, at 17, Belgrave Square, London, S.W.1.

CRANES (DEREHAM), LIMITED, Dereham, and CRANE FRUEHAUF TRAILERS, LIMITED, North Walsham, have moved their London office from Sicilian House, Southampton Row, to 8 York Buildings, Adelphi, London, W.C.2.

LUPTON BROTHERS LIMITED, the Accrington iron founders, are moving their presswork department from Grange Lane to the Fountain Mill, which they have acquired. Fifteen new 75-ton presses are also being installed at the new works.

"FAIR ORIANA," the latest in the series of documentary films made by the United Steel Companies, Limited, had its premiere at the Gaumont Cinema, Sheffield, on Wednesday, July 26. (The film has already been previewed in London and reviewed in this JOURNAL.)

A BIRMINGHAM ENGINEERING FIRM, Linfold Engineering Company, Limited, of Baker Street, is likely to be told that Solihull has "no suitable sites available" for building a new factory. The firm, general engineers of hydraulic equipment, has asked the Solihull Council for a site on which to build a factory of up to 5,000 sq. ft.

FIVE OVERSEAS LABOUR OFFICIALS visited Sheffield on July 20 for discussions on labour problems. The officials, from Grenada, Kenya, Malta, Northern Rhodesia and Nyasaland, visited the offices of the Sheffield and District Engineering Trades Employers' Association in Clarkehouse Road, and later went to the Thorncliffe works of Newton Chambers & Company, Limited.

BIRTLEY ENGINEERING, LIMITED, a member of the BSA group, is to build new main offices in Chesterfield to replace their existing accommodation in Market Place Chambers. The site is as at the disused East Coast railway station in West Bar. There are about three acres and a frontage on Barker Lane. Another frontage is where there is expected to be a road development by Chesterfield Corporation.

DURING DEMOLITION of a disused brick kiln at the Lowood works of General Refractories, Limited, at Deepcar, Sheffield, on July 20, the roof collapsed and one man was killed and another narrowly escaped death. The men were working for Barlborough Metals, Limited, Barlborough, near Clowne, a firm contracted to demolish several old kilns. The dead man, Mr. Jack Spry, was stripping metal from the kiln with oxy-acetylene equipment.

OVER 300 DELEGATES from industry, unions, universities, research associations and government departments attended the three-day DSIR Ergonomics Conference in London last September. The proceedings of the conference, now published, includes all the papers and a verbatim report of the delegates' discussions. The volume entitled "Proceedings of Conference on Ergonomics in Industry, 27-29 September, 1960," is available from H.M.S.O., price 12s. 6d. (by post 13s. 4d.) ($2.25 USA).

IN THE MUFFLED BELL CHAMBER of Taylor's Bell Foundry at Loughborough, a new bell-ringing record has been set up. Mr. Bob Smith, of Loughborough College, who rings the bells at Loughborough Parish Church, led a team of ringers who succeeded in a peal of Plain Bob Major, of 32,704 changes on eight bells, which lasted 15¼ hours. It was the longest perfect peal on record. The team of eight were striving to reach the maximum of 40,320 changes on their eight bells.

THE INSTITUTE OF WELDING is organizing its first large-scale exhibition at Buxton next year, in connection with its spring meeting there from April 30 to May 4. The theme of the meeting is welding for power generation, and nearly 30 papers, including several from other countries, are to be delivered. "Welding Engineering 1962," as the exhibition has been named, will illustrate progress of welding technology in this country, especially in meeting the needs of modern power-generation plant construction.

THE PERKINS GROUP has received a £2,000,000 order for diesel engines from the West German firm of Gebr. Claas Maschinenfabrik, makers of combine harvesters. The order is for four and six cylinder agricultural engines and is reported to be the largest single order for diesel engines placed in Britain by a German company. Since Perkins first supplied Claas with diesel engines in 1953 over 30,000 Peterborough-made engines have been delivered to the German firm, whose headquarters are at Harsewinkel.

Obituary

Mr. HERBERT WILLIAM HINTON, former home trade sales manager, Smith & Davis, Limited, brassfounders, Beacon Works, Wednesbury, has died. He relinquished the post in December, 1960, but continued as a consultant. He joined the firm in 1913.

The death is announced of Mr. GEORGE SANDLAND, for 35 years with International Nickel Company (Mond), Limited, London. Trained as an engineer-designer with Vickers-Armstrongs, Limited, he joined the late Sir William Griffiths and Miss E. W. Parker in re-organizing the firm's development and research department, and more recently was editor of the *Nickel Bulletin*.

Mr. JAMES SHAW, who has died at his home in Colwyn Bay, was a native of Bonnybridge, where he began his career with the firm of Smith & Wellstood, Limited. In 1909 he left to join the Planet Foundry Company, Limited, Guidebridge, near Manchester, of which his uncle, Mr. James Learmouth, was co-founder. Mr. Shaw was made managing director of the Planet Foundry in 1928, which was a member company of the Light Castings, Limited, group—the forerunner of Allied Ironfounders, Limited. Mr. Shaw was made a director of Allied Ironfounders on its formation and in 1935 he went to London as managing director, subsequently becoming chairman of the company in 1944, which appointment he held with the position of managing director until his retirement in October, 1956. He was a liveryman of the Worshipful Company of Founders and a Fellow of the City of London.

Personal

Mr. J. H. McCuaig has resigned from the board of Harland & Wolff, Limited.

Mr. F. J. Everest has been appointed general manager, Stein Atkinson Vickers Hydraulics, Limited.

Mr. A. J. R. Walter has been co-opted as an additional director of Fairbairn Lawson Combe Barbour, Limited.

Mr. R. C. Thompson and Mr. L. F. Butler have been appointed directors of William Doxford & Sons (Engineers), Limited.

Mr. T. A. Read, secretary to the Perkins group, Peterborough, has been appointed to the board of Perkins Engines, Limited.

Mr. Thomas A. Uthwatt has been elected to the board of Mather & Platt, Limited. He is head of the company's research department.

Mr. R. A. Nicholson, steel sales manager, Sanderson Brothers & Newbold, Limited, Sheffield, has retired after 51 years' service with the company.

Mr. A. Robert Enshaw has been appointed executive director in charge of the Government contracts department of the Plessey Company, Limited.

Mr. W. G. Ball, founder and chairman of Precision Products (Cumberland) Limited, of Alston, has been appointed a Justice of the Peace for Cumberland.

Mr. E. J. L. Howard retired recently from the position of chief metallurgist with Mather & Platt, Limited. He has now established himself as a consulting metallurgist.

Mr. K. G. Harris presented a paper on "Cupola Experiments" to the foundry section of the Hungarian Mining and Metallurgical Institute in Budapest on May 25.

Formerly general sales manager of Sanders & Forster, Limited, of London and Essex, Mr. J. F. D. Wood has been appointed sales director with effect from July 1.

Mr. Ranald K. Cuthbertson, W.S., has been appointed chairman of R. B. Tennent, Limited, rollmakers, of Coatbridge, in succession to the late Mr. James Tennent.

Mr. P. A. Russell, formerly joint managing director, has been elected chairman of S. Russell & Son, Limited, engineers of Leicester, in succession to his brother Mr. George Russell.

Mr. N. J. Winnett, previously manager of the Swinton works, near Mexborough, of G.E.C. (Domestic Equipment) Limited, has been appointed production director of the company.

Mr. J. C. Shapley, works manager at the Hoover factory, Perivale, Middlesex, and who recently completed 25 years' service with the company, has been appointed to the board of Hoover (Electric Motors), Limited.

Mr. S. Walker has been appointed chairman of Laycock Engineering, Limited, a subsidiary of Birfield, Limited. Mr. H. E. Hill has resigned as chairman, but remains on the board of Laycock Engineering, Limited.

Mr. B. Robinson has been appointed a director of Bettles & Sons, Limited, engineers, Wobaston Works, Fordhouses, Wolverhampton, a wholly-owned subsidiary of Midlands Industries, Limited, Wolverhampton.

Mr. Roger Lawson has been appointed assistant chief engineer for Boots Pure Drug Company, Limited. He joined Boots in the engineers' department in 1929. For the last ten years he has been contracts and estimating engineer.

Mr. N. R. R. Brooke, a director of Guest Keen & Nettlefolds, Limited, and G.K.N. Steel Company, Limited, has been appointed to the local board of Lysaght's Scunthorpe Works, a branch of G.K.N. Steel Company, Limited.

Mr. W. B. Campbell, of Bellshill, Lanarkshire, has been nominated as this year's winner of the John Bell Travelling Scholarship. Mr. Campbell is a degree student, who has been sponsored for the four years of his course by Colvilles, Limited.

Mr. M. Toy, B.Sc. Tech., Grad. I. Mech.E., who has just joined the plant engineering section of the British Steel Castings Research Association, Sheffield, as a senior investigator, will be concerned mainly with work on foundry plant and equipment.

Mr. L. Turner of the magnet department toolroom of James Neill & Company (Sheffield), Limited, hacksaw and tool manufacturers, Sheffield, has been presented by the chairman, Sir Frederick Neill, with a gold watch on completing 25 years' service.

Mr. J. Greatrex, formerly methods engineer at Brown, Lennox & Company, Limited, Pontypridd, has been appointed technical sales representative of the Harborough Construction Company, Limited, to cover the South Wales and south-west England areas.

This month sees the retirement of Mr. Tom Poole, who is a holder of the *Croix de Guerre* and who is foreman in charge of the continuous-moulding plant at the Coalbrookdale Company, Limited. He started work in the Severn Foundry 50 years ago as a moulder.

Dr. W. J. Gibbs has relinquished his appointment as manager of the engineering mathematics department, Associated Electrical Industries (Rugby), Limited, and remains as a group company consultant. Mr. N. Kerruish is appointed to succeed Dr. Gibbs as manager.

Mr. Stafford Beer, who has been head of the department of operational research and cybernetics of the United Steel Companies, Limited, since its inception in 1957, has resigned, and will be succeeded by Mr. David Owen, previously assistant head of the department, on August 1.

Leigh & Sillavan, Limited, announce that Mr. Duncan Cameron, who has been manager of its pig-iron and ferro-alloys department for 26 years, is retiring on July 28 and Mr. J. E. Harrop will be taking over as manager of the department with effect from the beginning of August.

Mr. Frank Denton, a member of the accountancy staff of Thos. W. Ward, Limited, Sheffield, was presented with a gold watch on July 13, by Mr. Harold W. Secker, chairman of the company, to mark his retirement after 50 years' service with the company. departmental colleagues also gave him gifts.

Mr. Hugh Wyn Griffith, general manager of Shirley Developments, Limited, manufacturers of textile testing apparatus, Manchester, has been elected chairman of the Northern Group of the Scientific Instrument Manufacturers Association and will represent the group on the Council of the Association.

Chairman of directors of Thomas Broadbent & Sons, Limited, Central Ironworks, Huddersfield, Mr. Brian L. Broadbent has been appointed a Civil Defence area controller. His area contains a population of 350,000 and comprises Huddersfield, Dewsury, Batley,

Personal

Spenborough, Mirfield, Kirkburton, Holmfirth and the Colne Valley.

Holman Brothers, Limited, Camborne, announce that Mr. W. J. FORD, at present manager of the firm's Welsh office at Cardiff since 1955 has been appointed to take charge of the North Midlands office at Sheffield, and that Mr. A. M. GERIG, who was on Mr. Ford's staff as a representative, has been appointed manager of the Cardiff office.

Mr. JAMES MALCOLM HARRISON, vice-chairman, Peglers, Limited, brassfounders, Belmont Works, Doncaster, has been appointed chairman of the company, to succeed Mr. A. E. EMBERTON who has resigned. Mr. W. WICKS has also resigned, and Mr. ERNEST WEBSTER and Mr. JOHN WESLEY EMBERTON have been appointed directors to fill the vacancies on the board.

Desoutter Brothers, Limited, announce that Mr. K. F. TUNNICLIFF has joined the Midlands staff, Mr. E. MACHAN in the North-East of England has replaced Mr. J. Fox who has transferred to North-East London to take over from Mr. C. L. STARTUP, who has retired. A further new appointment is Mr. P. C. BOTTING, who will be responsible for the Central London area.

The following Qualcast subsidiary board appointments have been made with effect from July 1. Mr. J. B. RACE has been appointed director of Fleetway Manufacturing Company, Limited; Mr. A. C. MALCOLM a director of Fellows & Bate, Limited; Mr. W. MCALPINE and Mr. J. COOPER, directors of Suffolk Iron Foundry (1920), Limited, and Mr. C. OAKMAN a director of Qualcast (Cuffins), Limited.

At the Annual General Meeting held on Thursday, July 13, 1961, of the Scientific Instrument Manufacturers' Association of Great Britain, 20, Queen Anne Street, London, W.1, Mr. A. W. JONES (Fleming Radio (Developments), Limited) was installed as president for the year 1961-62 by Mr. G. C. OTTWAY (W. Ottway & Company, Limited), the retiring president, who now becomes a vice-president of the Association.

Four long-service employees of F. H. Lloyd & Company, Limited, Wednesbury steelfounders, have been presented with cheques on their retirement by the chairman and managing director, Mr. F. N. Lloyd. They were: Mr. R. S. LAVENDER, a pattern inspector with 51 years' service; Mr. J. A. DAVIS, maintenance foreman (47 years); Mr. G. B. POWELL, fettling foreman (47 years), and Mr. H. L. PARSONS, foreman electrician (41 years).

Mr. ERIC CARR, a driver for George Sorby, Limited, special steel manufacturers, Sheffield, has suggested to Mr. Marples, the Minister of Transport, that variations in the colouring of cats' eyes in the road centre would make them additionally useful. He suggests that they should change to a warning amber on approaching a dangerous section of the road, and be coloured red along a dangerous section, and revert to white in normal conditions.

Mr. GEOFFREY M. WILSON has been appointed a consultant on the staff of the International Bank for Reconstruction and Development and will take up his duties in September. Since 1958, he has been financial attaché at the British Embassy in Washington, D.C., and in this capacity is currently alternate executive director for the UK of the World Bank and of its two affiliates, the International Finance Corporation, and the International Development Association.

It has been pointed out that the successor to Mr. D. D. CRUICKSHANK as general manager of the Renfrew, Dalmuir, and Dumbarton works of Babcock & Wilcox, Limited, is Mr. T. CARLILE, and not as erroneously stated in our July 13 issue, Mr. T. Castle. Mr. Carlile has been with Babcock & Wilcox since 1944, and has served the company in various capacities in both Scotland and New York. He is an associate of the City and Guilds Institute of London, and a member of the Institution of Engineers and Shipbuilders.

The EARL OF COURTOWN, head of the office administration department of Imperial Chemical Industries, Limited, has been re-elected president of the Institute of Office Management. Mr. DENIS GREENSMITH, a director of Boots Cash Chemists (Western) and controller, administrative services, Boots Pure Drug Company, Limited, has been elected chairman of the Institute Council in succession to Mr. GEOFFREY J. MILLS, deputy chief comptroller, J. Lyons & Company, Limited. VISCOUNT DE L'ISLE, V.C., has resigned as a vice-president upon taking up his appointment as Governor-General of Australia.

Mr. HENRY F. SHERBORNE, managing director of Yorkshire Imperial Metals, Limited, has been appointed president of the British Non-Ferrous Metals Federation in succession to Mr. W. W. DOLTON, managing director of the Delta Metal Company, Limited. Mr. N. I. BOND-WILLIAMS, of Aston Chain & Hook Company, Limited, Mr. C. H. M. HOLDEN, of Charles Clifford, Limited, Mr. W. F. SLATER, of Thomas Bolton & Sons, Limited, and Mr. G. A. D. SMITH, of Imperial Chemical Industries' metals division, have been appointed vice-presidents of the Federation. Mr. W. F. BRAZENER, of the Mint, Birmingham, has been appointed treasurer.

Mr. JOHN T. MCCARLEY, director of the (American) Manufacturing - International group, has been appointed managing director of the British Division of the Yale & Towne Manufacturing Company in succession to Mr. JOHN O. SEWELL. Mr. Sewell has resigned his position to accept an executive position with a prominent British company, but will remain with Yale & Towne in an advisory capacity until taking up his new appointment on September 1. Mr. McCarley, who is 52, joined Yale & Towne in 1936, in Detroit, Mich, as an engineer in the company's lock and hardware operations. He was later transferred to its materials-handling organisation, and for five years was assistant general manager of the company's materials handling division at Philadelphia, USA. As director of Manufacturing-International, he became personally acquainted with the operations of the British Division at both Willenhall and Wednesfield.

Sheffield University Council made the following appointment on July 7 to take effect on October 1:—Dr. N. H. MARCH, reader in theoretical physics in the University since 1957, to hold the newly-created Second Chair of Physics at the University. He graduated in physics at King's College, London, in 1948 and gained the degree of Doctor of Philosophy in London University in 1951. He became lecturer in physics at Sheffield University in 1950. His principal work has been in the behaviour of electrons in metals and alloys, and he has published many papers in this and related fields since going to Sheffield. Other appointments:—Dr. V. C. L. HUTSON, lecturer in applied mathematics; Dr. H. J. SULLIVAN, assistant lecturer in geology; Mr. J. W. ROSS, junior research Fellow in physics; Dr. I. HAWKES, lecturer in the post-graduate School of Mining; Dr. C. J. BALL, lecturer in metallurgy; Mr. A. MITCHELL, assistant lecturer in metallurgy; Mr. B. F. DYSON, temporary assistant lecturer in metallurgy.

Photo by courtesy of Fibres Division, Imperial Chemical Industries Ltd. Manufacturers of 'Terylene' polyester fibre.

C IS FOR CONVEYOR BELTS at a new I.C.I. plant in Cheshire, where eight Goodyear belts of rubber and 'Terylene' carry coke, burnt lime and coke/lime mixture. 'Terylene' was chosen for its flexibility and strength, which allows exceptionally deep troughing so that deck plates, skirt boards, etc., are eliminated and idlers can be spaced 50% wider apart. 'Terylene' also withstands the heat of the coke (carried at up to 120°C), is rotproof and resists moisture penetration. For the *right* conveyor belt, installed in the *right* way and maintained in the *right* manner, contact Goodyear Industrial Products Division at Wolverhampton.

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Company News

NEWMAN HENDER & COMPANY, LIMITED, brass-founders, engineers, etc., of Stroud (Glos)—There was a contraction in group profits to £322,856 (£380,672) and in net profit to £124,893 (£190,972). The dividend is maintained at 12½ per cent.

THERMAL SYNDICATE, LIMITED, manufacturers of fused quartz and silica, and high-temperature refractories, etc., of Wallsend—The company announces a one-for-one scrip issue and after that plans a one-for-five rights issues at £3 for the £1 shares.

B. & S. MASSEY, LIMITED, manufacturers of smithy and drop stamping plant, forging presses, etc., of Manchester—Group net profit for the year to March 31, 1961, increased to £86,817 (£72,282) after tax of £40,801 (£39,883) and with a final of 10 per cent., dividend is being raised to 15 (12½) per cent.

HORSELEY BRIDGE & THOMAS PIGGOTT, LIMITED, constructional engineers, bridge builders, ironfounders, etc., of Tipton (Staffs)—A final dividend of 8¾ per cent. maintains the total of 12½ per cent. for the year ended March 31, 1961. Consolidated profits applicable to the company, amount to £312,048 (£330,563), subject to tax of £177,929 (£147,524).

G. D. PETERS & COMPANY, LIMITED, manufacturers of railway and rolling stock equipment, etc, of Slough (Bucks)—Manufacturing and trading assets have been transferred to a new subsidiary, leaving it as a holding company exercising control over group policy. Lord Inverforth, chairman, says the results to date fully justify the cautious optimism in his statement with the 1960 accounts.

BROKEN HILL PROPRIETARY COMPANY, LIMITED, iron and steel manufacturers, etc., of Australia.—Although complete figures are not yet available, consolidated net profits in the region of £A15,000,000 are expected for the year to May 31, 1961. The 1959-60 group profit was £A13,700,000. The parent's net profit is announced as £A2,648,816 and receipts from other sources give a total net profit of £A9,202,635.

EDWARDS HIGH VACUUM, LIMITED, manufacturers of high vacuum pumps, gauges, plant and accessories, of Crawley (Sussex)—The rights issue foreshadowed will raise about £850,000. The number of shares to be offered and the issue price will be announced at or before the meeting to be held towards the end of this month. The share capital will be increased to £1,225,000 by the creation of 875,000 ordinary shares of 4s. each.

WILLIAM JACKS & COMPANY, LIMITED, metal merchants, etc., of London, E.C.2—Besides raising the dividend for 1960, following a sharp rise in profits, it is proposed to make a one-for-10 scrip issue in September. Net profit is £157,021 (£108,854) after tax of £217,000 (£160,000). Final dividend of 9½ makes 12½ (10) per cent. for the year. There is also an unchanged tax-free distribution from capital profits of 3 per cent.

ENGLISH ELECTRIC COMPANY, LIMITED—Offers for the preference, ordinary, and "A" ordinary capitals of W. H. Dorman & Company, Limited, manufacturing engineers and ironfounders, of Stafford, have been accepted by holders of over 85 per cent. of the preference, over 95 per cent. of the ordinary, and over 82 per cent. of the "A" ordinary. All offers have accordingly been made unconditional. They will remain open for acceptance until further notice.

DAVEY, PAXMAN & COMPANY, LIMITED, manufacturers of diesel engines, boilers, rotary vacuum filters, etc., of Colchester (Essex)—Net profit for the year to March 31, 1961, is £111,392 (£130,011), after tax of £106,221 (£61,984). The order-book has substantially increased in recent months, says the chairman, and works should again be at full capacity from the latter part of this year. Much of this business is on extended delivery, however, and cannot be counted to affect the current year's trading.

CRANES (DEREHAM), LIMITED, engineers and trailer builders, of Dereham (Norfolk)—Although the order-book is encouraging, the current year will be one of development and results should be anticipated with caution, says Mr. L. H. Allwood, chairman. The record turnover of last year is not expected to be repeated, as two large contracts contributed substantially to that year's results. Of long-term prospects, however, Mr. Allwood shares the board's enthusiasm and high hopes.

HADFIELDS, LIMITED, steelmakers, of Sheffield—In view of the rising costs and the inadequate increases in prices which may be charged together with the present uncertain state of demand for steel, the directors have decided to reduce the interim dividend to 2 (3) per cent. Since the authorized capital was increased from £4,000,000 to £6,300,000 in May, the 300,000 shares previously unclassified have been classified as ordinary so that the entire authorized capital is now comprised of £1 ordinary shares.

TRIPLEX FOUNDRIES GROUP, LIMITED—At the annual meeting last week the chairman, Mr. W. H. L. Harrison, announced that jubilee year plans for launching a non-contributory sickness and life assurance scheme for employees of the group had reached an advanced stage. Reviewing the past 25 years, Mr. Harrison said that the group had progressed to a position of strength and now received on average one application per week from other companies wishing to join the organization.

WOLVERHAMPTON METAL COMPANY, LIMITED, manufacturers of gunmetal, phosphor-bronze, and yellow metal ingots, etc.—Group profit contracted to £381,404 (£465,408) in the year ended March 1, 1961, but dividend is repeated at 32½ per cent. In the opinion of Mr. J. H. Furnival, the chairman, trading conditions were the most difficult for some years. Limited supplies of raw materials, coupled with fierce competition, narrowed working margins. The order-book, however, is satisfactory, he adds, and the plant is fully employed.

DOVER ENGINEERING WORKS, LIMITED, engineers and ironfounders, etc.—Immediate future capital outlay commitments are estimated at £8,700 and further commitments estimated at £56,400 are envisaged. Mr. Vivian Elkington, chairman and managing director, reports that the increasing trend in demand for the company's "Elkington Gatic" multiples and ducts has continued and sales in current year show an improvement over the corresponding period last year. Works and plant extension during the year is not yet fully reflected in the accounts.

DELTA METAL COMPANY, LIMITED—The company has received acceptances in respect of 1,733,616 ordinary shares in Davis & Timmins, Limited, makers of automatic screw machine products, of London, E.17, in response to its offer. These acceptances, together with the 443,728 ordinary shares already owned within the Delta group, represent 89.46 per cent. of the issued ordinary capital. Delta has accordingly declared the offer unconditional subject to permission to deal being granted in the Delta new ordinary shares to be allotted. It has extended its offer until the close of business on August 18.

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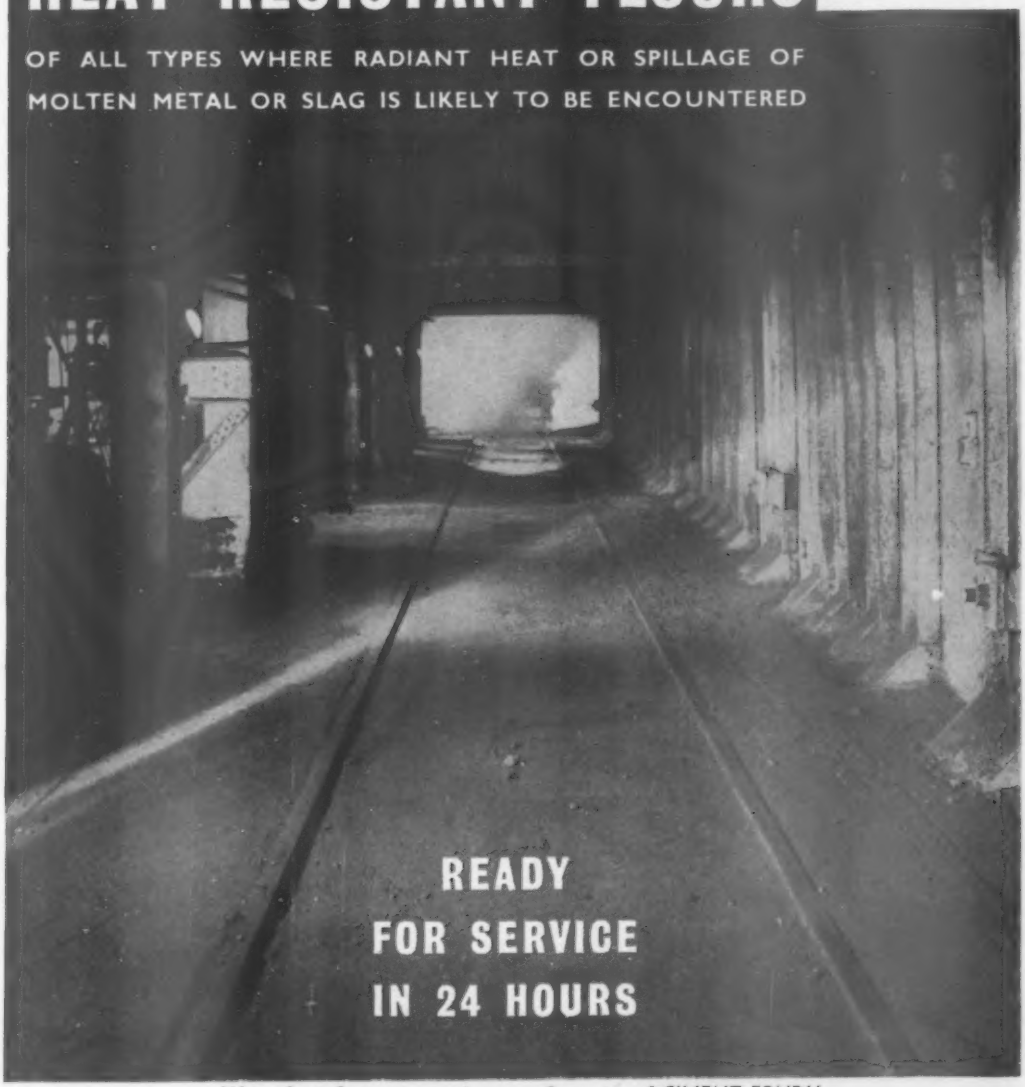

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AP3/74

Raw Material Markets

Iron and Steel

Although overall production of pig-iron in June was on a slightly reduced scale at a weekly average of 297,400 tons, compared with 300,200 tons for the previous month, the annual rate of output exceeds 15,750,000 tons. The tonnage available in all grades is ample for current needs of home users and producers have no difficulty in coping with demands for both consumption and stock requirements. The steelworks continue to take up substantial tonnages of basic pig-iron, but there is a lessening in their call for supplies. Outputs, which are well below capacity levels, are governed by demands, which includes consignments for export.

The iron foundries also are well supplied in the grades of pig-iron of their choice, and prompt deliveries are being made either from stocks held by the furnaces or from current production. This position does not warrant forward buying and orders are confined to the production needs of the foundries. Most makers of pig-iron have tonnages to spare after home needs have been met, and are happy to supply overseas buyers as and when orders can be obtained.

The engineering and speciality foundries continue to take up large quantities of pig-iron mostly in the low phosphorus grades, with reasonably good tonnages of hematite and some refined iron. There is, however, no pressure for supplies and recently demands from these foundries have shown signs of decreasing, which to some extent may be due to the incidence of holidays. Steady demands come from the light, jobbing, textile, and some of the engineering foundries for supplies of high phosphorus pig-iron but they are not heavy and much below productive capacity. Consignments of this iron continue to be shipped abroad.

Up to the present the engineering foundries producing high duty castings have been able to obtain fairly substantial outputs, but there is a noticeable falling off in forward buying. They appear to be able to maintain a five-day working week with the orders at present on hand, but they are eating into their order-books, and the business now coming to hand is on a reduced scale. Unless this shows improvement the present rate of production will be difficult to maintain, and holiday influences now in operation are also likely to affect demands adversely.

At the light foundries producing castings for domestic utensils there is little improvement in their trade and they could accommodate much more work, as could also the jobbing and textile foundries. Builders castings are in fairly good demand, and the foundries making cast-iron pipes are receiving good support.

The foundries generally are able to obtain their requirements of scrap, special grades being taken up as they arise. They are also well supplied with foundry coke, ganister, limestone, and firebricks.

The re-rollers are finding it increasingly difficult to obtain sufficient business to keep their mills occupied for a full working week. Business is moderate for most of their products, apart from reinforcing rods and bars for which there continues a good demand. Only a moderate amount of business is available for small bars, light sections, strip, and bright drawn bars and this is for prompt rolling as there is little forward buying.

The re-rollers have no difficulty in obtaining all the steel semis they require, as apart from the stocks held by them home steelworks have tonnages to spare. Mild steel material in particular is plentiful, and users of the high carbon and alloy steels are now able to cover for their needs for reasonable delivery dates. Available supplies of suitable defectives and crops are readily accepted by the re-rollers.

Non-ferrous Metals

The holiday period which has now begun in this country, the United States and on the Continent is the dominating factor in non-ferrous metal markets. Tin is experiencing quiet trading conditions in London and New York, although Singapore continues to be active. Nevertheless the price in London has been more than maintained due to the lack of sellers combined with small but steady buying orders. But it has been achieved in the face of the US Government's decision to release 500 tons of the Texas Smelter tin. This release will be made by tender in early August and applications from overseas buyers will be considered. Export of the metal will be subject to the normal export duty. The US market is relatively idle, and the price is fluctuating narrowly between $1.15 and $1.16 cents a pound.

Copper markets, too, have felt the effects of the holiday period and also the clearing up of the Kennecott labour troubles. However, markets on both sides of the Atlantic are sensitive, and with the announcement from the US Copper Institute that world copper stocks fell further in June they have become receptive to bullish factors. Thus, when it became known that the workers at Potrerillos and at El Salvador had rejected a 7 per cent. wage increase plus fringe benefits, thereby making a strike at these two Chilean mines a distinct possibility, New York and London responded favourably.

Lead is quiet in London and in New York with the LME price moving narrowly around £65 a ton and the US quotation being unchanged at 11 cents a pound. Zinc has been quietly steady, but stocks are ample to cope with all anticipated demand. The LME quotation is steady around £78 a ton and the US quotation is still called at 11 cents a pound.

Conference on Creep and Fracture

A joint international conference on creep and fracture is to be organized jointly by the American Society of Mechanical Engineers, the (British) Institution of Mechanical Engineers and the American Society for Testing Materials. The conference (to be held in New York from August 25 to 28,1963 and in London (during October, 1963) will be devoted to the mechanical properties of engineering materials at elevated temperatures, the emphasis being on the utilization by the mechanical engineer of creep and rupture data on current materials in the design of equipment to be used at elevated temperatures. Preprints of papers will be issued to delegates in advance of the conference and simultaneous-interpretation facilities in English, French, and German will be provided at the London meeting.

A CONTRACT WORTH £1,000,000 in connection with the construction of the new railway marshalling yard at Tinsley, Sheffield, has been placed with Lehane, Mackenzie & Shand, Limited, Matlock, Derbyshire. The firm's work will include the excavation of 4,500,000 tons of earth and hauling it two miles. The contract is expected to take 28 months to complete. The new yard, which will cost some £7,000,000 altogether, will handle 5,000 wagons a day. Its construction will lead to the closing of various sidings in Sheffield and Rotherham areas.

Baker Perkins Machinery at work . . . . . *at Peter Brotherhood Ltd.*

Peter Brotherhood Ltd. use this 'Cadet' Rotary Table Shot Blast Machine for a wide range of application at a high production rate. Note especially the control desk which includes signal lights, 24 volt current socket for inspection and ammeters indicating the shot output of the impeller. The wiring circuit is arranged for automatic operation to cut out human errors.

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HISTORICAL NOTE

Peter Brotherhood Ltd. were established in London in 1868. In 1907, the works was transferred to Peterborough, Northants. In their Foundry, they produce a wide range of general engineering castings for air and gas compressors, steam turbines, steam engines, refrigeration plant, water turbines, chemical filtration plants, textile machinery, brewery machinery, and many other applications

Current Prices of Iron, Steel, and Non-ferrous Metals

(Basis prices, delivered unless otherwise stated. In accordance with Iron and Steel Board Price Determination, 1961, No. 2, the prices of products listed below coming under the board's control are increased by 1 per cent.)

July 26, 1961

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over, Middlesbrough, £21 17s. 0d.; Birmingham, £21 9s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham; £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6s. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si less than 2 per cent, S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over; N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 9s. 0d.; Birmingham, £25 13s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(per ton unless otherwise stated, delivered)

Ferro-Silicon (6-ton lots and over).—45 per cent. Si, £45 0s. 0d. to £48 0s. 0d., scale 15s. 0d. per unit, lumpy, 75 per cent. Si, £62 0s. 0d. to £66 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s.10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 10s. 3d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 13s. 3d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £81 10s. 0d. to £84 10s. 0d., basis 60per cent. Cr scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr.; 0.10 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.06 per cent. C,* 1s. 11d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent. Cb + Ta, 19s. 0d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £58 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., 100 tons and over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 100 tons and over, £32 5s. 6d.; hard (0.41 to 0.60 per cent. C), 50 tons and over, £33 17s. 0d.; silico-manganese, 50 tons and over, £42 16s. 6d.; free-cutting, 50 tons and over, £35 4s. 6d. SIEMENS MARTIN ACID (50 tons and over): Up to 0.25 per cent. C; £40 11s. 0d.; silico-manganese, £43 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (50 tons and over).—BASIC: Soft, up to 0.33 per cent. C, £37 0s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £38 2s. 6d.; acid, up to 0.25 per cent. C, £41 14s. 0d.

FINISHED STEEL

Heavy Plates and Sections (50 tons and over).—Ship plate (N.-E. Coast), £40 7s. 0d.; boiler plates (N.-E. Coast), £42 17s. 0d.; floor plates (N.-E. Coast), £41 16s. 0d.; angles (N.-E. Coast), £38 1s. 6d.; joists (N.-E. Coast), £37 17s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 6d.; under 4 tons to 2 tons, £41 3s. 6d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £67 11s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £66 7s. 0d.; nickel-chrome, £97 1s. 0d.; nickel-chrome-molybdenum, £109 14s. 0d., in lots of 25 tons and over.

NON-FERROUS METALS

Copper.—Cash, £228 15s. 0d. to £229 0s. 0d.; three months, £232 10s. 0d. to £232 15s. 0d.; settlement, £229 0s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 2½d. per lb.; rods, 245s. 6d. per cwt. basis; 20 s.w.g., 280s. 6d. per cwt.

Tin.—Cash, £909 10s. 0d. to £910 0s. 0d.; three months £924 0s. 0d. to £925 0s. 0d.; settlement, £910 0s. 0d.

Lead (Refined Pig).—Second half July, £65 0s. 0d. to £64 15s. 0d.; second half October, £66 0s. 0d. to £66 2s. 6d. settlement, £65 2s. 6d.

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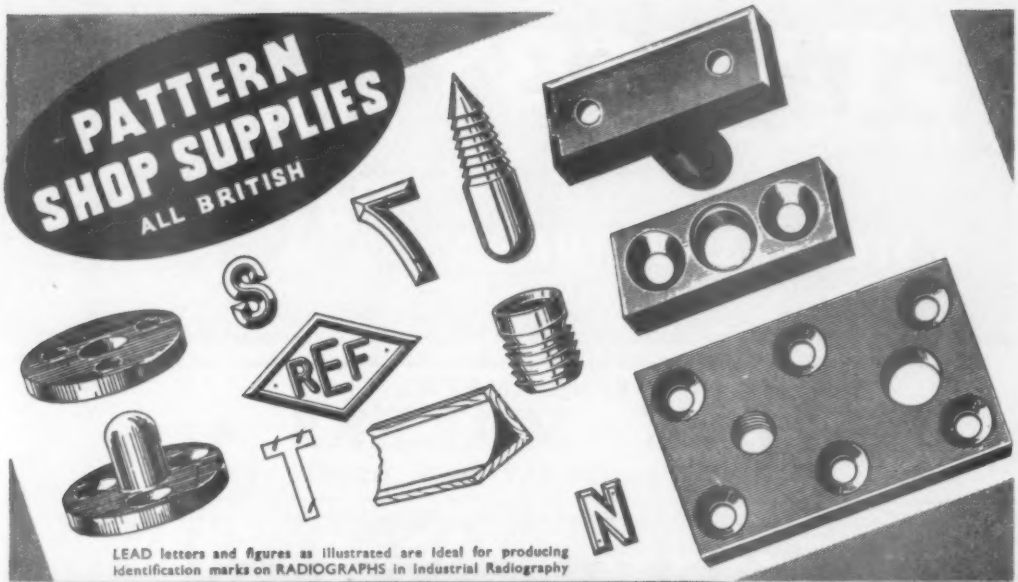

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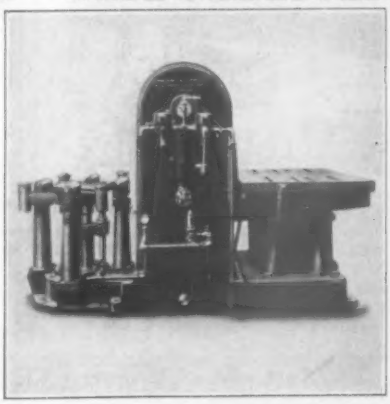

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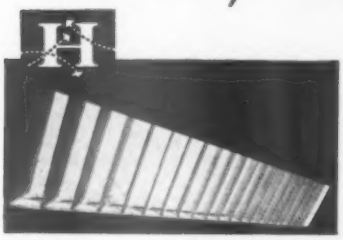

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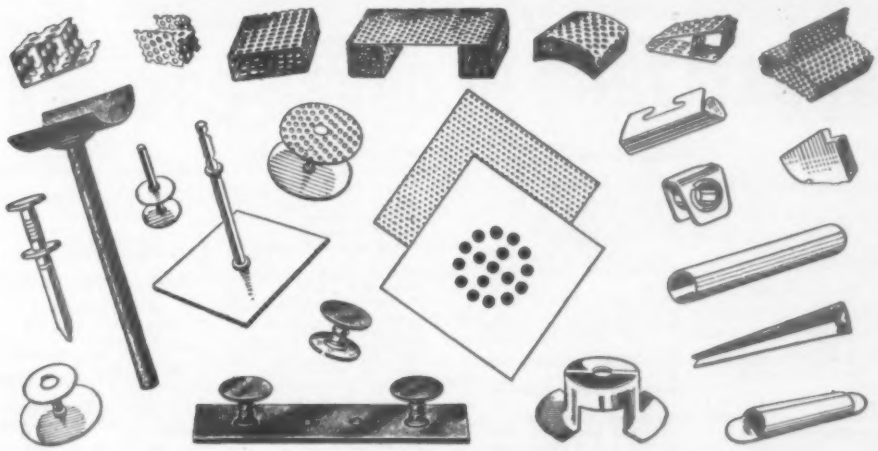

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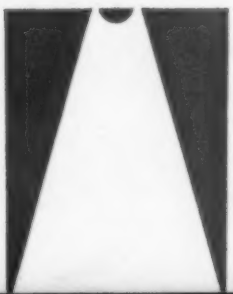

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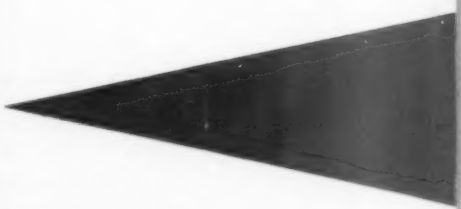

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